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POPULAR Computing WEEKLY

24-30 July 1986 Vol 5 No 30

40 Loch Rd

Acorn plans new BBC this autumn

- Acorn is to launch a new mass-market micro
- The machine, to be called the Baby BBC, will come bundled with monitor, $3\frac{1}{2}$ inch drive and software
- Will it be a direct challenge to Amstrad in the home/business market?

Full details below and inside

ACORN will challenge Amstrad this Autumn with the launch of the Baby BBC a cut-down version of the Master including monitor and $3\frac{1}{2}$ inch disc drive

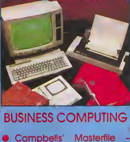
continued on page 4 ▶

COLOUR FEATURE

OCP Art Studio now out on Commodore 64

see page 16

SPECIAL SUPPLEMENT



BUSINESS COMPUTING

- Campbells' Masterfile — now on Amstrad CPCs
- Integrated suite for C128 from Timeworks
- BBC word processing
- PCW 8256 product round-up

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ABC

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs should be original It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted We cannot guarantee to return your programs – so please do not send your only copy **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work.

It came from Beyond's place

BEYOND'S major project for this Autumn is to be the first official *Star Trek* computer game. Beyond has licensed the title from Paramount, and is to launch the game in late September, the 20th anniversary of the TV program.

The programming team working on the project is headed by Mike Singleton, author of the *Lords of Midnight* series. It is being billed as an arcade/strategy game, and is intended to include speech synthesis. It will be released initially in Spectrum, Commodore Amstrad and Atari ST format.

Beyond publisher Francis Lee observed that, "the *Star Trek* project will be the most significant licensing deal signed this year" while marketing manager Marc Peirson commented that Beyond expects the project "to be a most significant step in the evolution of the computer game."


Francis Lee and Marc Peirson plan their next launch

Morgan bundles cheap Philips CP/M machine

AMSTRADITIS has struck at Morgan Computer. The London-based company, which specialises in discount and secondhand micros, is bundling the Philips P2010 micro with a Silver Reed EXP400 daisywheel printer for £490.

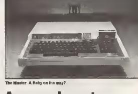
The P2010 is a transportable twin disc CP/M machine. It's large and bulky by the standards of today's portables, but as it come with bundled *Wordstar*, *Calcstar*, *MBasic* and terminal emulation software it represents a complete plug in and go system for small business users.

There isn't much in the way of expansion available for the system, but many users won't need this.

Morgan is also willing to bundle the machine with the more powerful EXP500 printer for only £15 extra, and will sell similar set-ups based on the Philips 2012 (which has twin 650K disc drives rather than the 2010's twin 180K versions) for £595 and £615 respectively.

People who brought the Philips computers from Morgan prior to the offer aren't being left out. They can buy an EXP400 for only £100.

Details from Morgan Computer, 179 Tottenham Court Road, London W1 (01-636 1138).


The Master. A Baby on the way?

Acorn plans to launch new BBC

◄ continued from page 1
for around £550. It will probably be launched at the time of the *PCW* Show in September, and Acorn is thought to have already signed up the Dixons retail chain to sell it in the run-up to Christmas.

The machine will look very much like the Master, but will lack interlacing, apart from an expansion bus, and will lack most of the Master's Rom. It is thought that the machine will incorporate a revised Rom, with some sources suggesting it will support 16 colours at resolution of 512 × 512.

This raises questions about the machine's compatibility with existing models but the machine is expected to be highly compatible with existing models, the main problems being its lack of user ports.

The machine is to be bundled with a selection of software from Acornsoft and other companies, some of which is being specially rewritten. Depending on the nature of the software included the Baby BBC could be in a good position to challenge Amstrad, as although the price of £550 is on the high side the educational cachet of the Acorn machines is still likely to help sales.

Acorn will also be pushing the machine into educational markets, where it can be sold as the natural successor to the BBC B or as a particularly low-end Master. The company is also thought to be talking to Olivetti about the possibility of badging the machine for sale in Europe, but as this would involve imposing a new standard on markets that are beginning to adopt the IBM PC and compatibles in education the prospects of this happening don't look good.

Commodore's free Amiga support

COMMODORE is to offer a free on-site repair service for the Amiga and the Series II PC range during their 12 month warranty period. The service is to be handled by independent maintenance organisation Mills Associates, which is already Commodore's sole recommended third party maintenance company.

Customers using the scheme will contact their dealer who will arrange for an engineer to call on site within 48 hours if necessary, cutting down on repair times considerably.

ELR apology

In last week's issue we published a letter which suggested that Eald Lonikon Robotics was no longer trading.

This is untrue. The company is now trading under the name ELR International, at 61 Nicholas House, The Mount, Guildford, Surrey GU2 5HN, tel 0483-505605.

The company still owns the copyright to *ZX Slowloader* but no longer sells the product. Further information can be obtained from ELR International at the above address.

Our apologies to the company for the error and for the inconvenience caused.

Apple gets sales boost

APPLE has posted $32 3 million profit (about 21 5 million) and an increase in sales for the three month period ended June 27, indicating that the company may be turning the corner the figures reverse the company's loss of $17 2 million (11 5 million) in the same period last year and the 20 per cent sales gain, up from $374 9 million (£250 million) to $448 3 million (£300 million), is its first in a year

Apple's turnaround comes at a time when even IBM is turning in reduced profits, and ascribing them to the increased "commodity" nature of the micro market Because of the more specialised nature of its product apple would seem to be at least in part insulated from price-cutting



Another fistful of dollars for Melbourne?

Fist is set to fly

FIST II, the follow-up to last year's massive hit, *Way of the Exploding Fist*, is due for release on the Commodore 64 on August 14

The new *Fist* will feature according to Melbourne House's managing director Geoffrey Heath, '100 different screens', and the game has more of an arcade adventure feel than its predecessor

In *Fist II*, the player travels through a variety of different locations, encountering many warriors proficient in various martial arts along the way

Fist II on the Commodore 64 will cost £9 95 A conversion to the Spectrum is scheduled for mid-September, with other machines to follow

Watford launches professional software for the BBC

WATFORD Electronics is to launch the Watford Professional range of software for the BBC micro range The first product in the range is a *View* printer driver Rom which supports a range of print features including underlining italic and superscript

The driver also offers an extended facility that allows you to specify characters and lines per inch numerically by sending a control code sequence direct to the printer It also defines a pad character to stop closely associated words being split during formation, resets all printer driver functions and selects new printer fonts and text colour

Among the other features included is the ability to download and edit the drivers storing them on disc afterwards

The Rom contains printer drivers for Epson Canon Kaga Taxan Acorn, Brother, Centronics, Juki, Ricoh and Facit printers It costs £37 65 including VAT

Details from Watford Electronics, 250 High Street Watford WD1 2AN (0923-37774)

Piranha to put the bite on software industry

PIRANHA is a new games software company launched by publishing company Macmillan Its publishing director Tony Feldman describes it as, 'a long term commitment to the game market'

The first five games are scheduled for launch in the Autumn, and will lean heavily on character licensing and film and TV tie-ins Design Design and Delta 4 are both working on the programming

Games planned so far are *Nosferatu, the Vampyre*, a graphic adventure based on the film *The Colour of Magic* a book-based adventure, *Strike Force Cobra Rogue Trooper* from the *2000 AD* character and *The Trap Door*

The latter is apparently based on a new TV series by Terry Wogan Productions due for transmission in October It's not clear who paid who for this particular licence

Gargoyle Games goes faster than light

GARGOYLE Games new label due for launch this Autumn is to be called FTL (Faster Than Light) and will specialise in arcade games

The new label's first products will be *Lightforce* a space battle game *Shockway Rider* involving street fighting on moving walkways in the 21st Century and *Samurai Dawn*, which is described as 'a tale of Eastern mystery and decapitation

All good clean family entertainment

Greg Follis of Gargoyle (left) Greg Follis of FTL (right) Spot the difference

Amstrad PCW gets $5\frac{1}{4}$ inch drive from Gemini

GEMINI Marketing has launched InterGem, a $5\frac{1}{4}$ inch disc interface for the Amstrad PCW machines The interface fits into the machine's second drive slot so is probably best suited for use with the PCW 8256 and is intended to allow the machine to run $5\frac{1}{4}$ inch versions of CP/M programs

Aside from running CP/M software it can also read IBM PC/MSDOS format data discs, allowing data generated on PCs to be manipulated by the PCW PCW data storage costs will also be lower because of the lower cost of $5\frac{1}{4}$ inch discs As an added extra Gemini is including a free copy of *Classic Invaders* with the interface, which costs £99 95

Details from Gemini Marketing, Unit 21, Concorde Road Dian Way Estate Exmouth, Devon EX8 4RS (0395-265165)

Product News

More Power to your Commodore

MAGNAM Products International has been appointed sole UK distributor for Dutch company KCS Power Cartridge for the Commodore 64/128 Teh cartridge includes a toolkit which adds new Basic commands disc and tape tools to speed up access times a machine code monitor, a printer tool and a series of utilities It costs £39 95

Details from Magnam Products International, Highlands, Spencer Wood Reading Berks RG7 1AH (0734-883193)

Budget priced disc box

DISC boxes being pretty much disc boxes, the major advantage of the Econo-Store 30 would seem to be it only costs £11 49 to store 50 5¼ inch floppy discs Fellowes Manufacturing cites heavy grade plastic, four rigid dividers and a heavily tinted lid as further plus points, but misses the fact that it look like it won't tip over backwards when you open it, like some boxes we could mention

Details from Fellowes Manufacturing (UK), Doncaster Road, Kirk Sandall Doncaster DN3 1HT

Buffer costs cut by MCS

MICRO Control Systems is selling a 256K internal buffer for Epson printers for only £189 some 30 per cent below the previous list price for the company's 128K buffer, whose price now drops to £149

Details from Micro Control System, Electron House, Bridge Street, Sandiacre Nottingham NG10 5BA (0602-391204)

Hanson returns

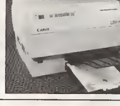
ROBICO has started the programming of *Myorem* the third and final part of the Rick Hanson trilogy The adventure casts the player as assassin and spy Rick Hanson and will be available for the BBC and Electron at £9 95 for tape and £12 95 for disc (BBC only)

Details from Robico Software 3 Fairland Close Llantrisant, Mid Glamorgan CF7 8QH (0443-227354)

Laser leasing

AT LAST an affordable laser printer Most real people could never dream of owning the hideously expensive eight page a minute Canon LBP-8 laser printer, so Microlease is willing to rent you one for £70 a week If you can't afford that either here's a picture

Details from Microlease, Forbes House Whitefriars Estate Tudor Road, Harrow Middx HA3 5SS (01-427 8822)



Diary Dates

JULY

24-27 July
Acorn User Exhibition
Barbican Centre London
Details: Hardware software and peripherals for the Electron BBC micro and Master machines
Trade only 10am-1pm on 24 July
Price £3 adults £2 children, £1 discount for advance sales
Organiser: Editionscheme, 01-349 4667

SEPTEMBER

3-7 September
Personal Computer World Show
Olympia, London
Details: Software and hardware for home educational and business computer users. For the first time this year the show is to be organised in three separate halls – business, games and education.
Price £2.
Organiser: Montbuild 01-487 5831

12-14th September
8th Official Commodore Computer Show
UMIST Manchester
Details A wide range of Commodore hardware software and peripherals. Formerly the Commodore Horizons show
Price £3 adults, £2 children £1 discount for advance booking.
Organiser Database Publications, 061-456 8383

26-28 September
Electron and BBC Micro User Show
UMIST, Manchester
Details: Software, hardware and peripherals for the Electron, BBC micro and Master machines. Produced by Acorn.
Price £3 adults £2 children £1 discount for advance booking
Organiser Database Publications, 061 456 8383

OCTOBER

3-5 October
The Amstrad Computer Show
Novotel London
Details Home and business software and hardware for the Amstrad range of computers.
Price £3 adults, £2 children £1 discount for advanced booking
Organiser Database Publications, 061 456 8383

30-31 October
Hampshire Computer Fair
Guildhall, Southampton
Details Business computers and communications.
Price. Free entry by business registration.
Organiser Testwood Exhibitions 0703 31557

NOVEMBER

7-9 November
Electron and BBC Micro User Show
New Horticultral Hall Greycoat Street, London SW1
Details. Hardware, software and peripherals for the Electron, BBC micro and Master series.
Prices £3 adults £2 children £1 discount for advanced booking
Organiser Database Exhibitions 061-456 8383

21-23 November
9th Official Commodore Computer Show
Novotel London
Details A wide range of Commodore Hardware software and peripherals
Prices: £3 adults, £2 children, £1 discount for advanced booking
Organiser Database Exhibitions, 061-456 8383

22 November
The 6809 Christmas Show
Royal Horticultural Hall Westminster London
Details Dragon software and peripherals.
Price
Organiser Microdeal, 0726 6820

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser

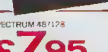
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COMMODORE 64/128 r.r.p. **£8.95**

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Star Letter

Seward exposed I

I was deeply annoyed while reading *Popular* July 10 as I came across the Commodore 64 game, *Baby Mole*. As I own a 64 my attention was duly grabbed by it.

Being a seasoned progammer/gamester I've seen many a mag come and go. *Personal Computer Games* included. In one of the last few issues of the latter I read, typed in and played (for many an hour) a game named *Baby Monty* or similar. It was programmed by the *Pigeon/Monty/Loco* maestro himself Tony Crowther.

This game sticks in my mind as, a) it was one of the first games I stored on my disc system b) my sister kept on playing it endlessly. I spent ages perfecting a joystick version.

Philip Seward has obviously just changed the instruction section, deleted the true programmer's name and inserted his own. This makes me angry as programmers, myself included, spend a lot of time perfecting their games albeit not as professional as some, but it's the learning and putting something of of yourself into the game that counts. Copying a game only shows you can type. You state yourselves, the articles should be original. You also state it is illegal to copy from magazines any programs that you would be tempted to submit yourselves.

Dave A Hall
Stockport

Debuggin clarified

Having studied the *Debuggin* program on page 26 of *Popular* July 3 I would like to make a couple of simple suggestions about loading and saving it.

The checksum at the end of each line is very useful and with the following additional lines added to the loader program will enable a complete check to be made when entering data.

The data save command *Save "debugcode"*, etc will need abbreviating to *dbugcode* if saving to disc and saving can be made at any stage by multiplying the number of completed lines of data input by eight and using the resultant in place of 2048. After all, inputting all those numbers in one go can be a bit frustrating!

Remember to make Y the number that it was when you saved the data and to change the start memory location in line 210 before saving the loader program again.

```
222 Let Z=Z+1: If Z=8 Then Y=Y
224 Let Y=Y+1: If Z=8 Then Z=1
226 CLS
228 Print N,"  ",Z,"  Line
Checksum = ";Y
260 Print checksum = " Total
270 Next N
```

Note: Change 260 total = 0:Y=0:Z=0

Mike Muggeridge
Petersfield

Gliders are on their way.

Seward exposed II

Popular Computing Weekly July 10, contained a Commodore 64 program that looked somewhat familiar to me as a program I had seen before. I scouted from magazine to magazine before I eventually found the original program written by Tony Crowther (of *Suicide Express*, *Black Thunder* fame) and called *Baby Monty*.

No effort appears to have been made to disguise the line format from the original program, which was in the August 1984 edition of *Personal Computer Games*.

A Thompson
Hornchurch
Essex

continued on page 11▶

Computers in the pop music industry

Only recently have computers become any use at all in making music both professionally and at home. There has been a great demand for an instrument which could manipulate music and replay it which has been met by an offshoot of computer technology. At home, the small microcomputer has been reborn as a musical instrument. However, in the music industry the reverse is happening. A new range of musical instruments have been developed in the shape of computers. These machines create the most advanced enhancement of sound possible, but instead of a few hundred quid for a home micro you could be paying well over £40,000.

One of the most popular musical computers is the Synclavier which costs about £40 000 but has limitless abilities. Among its many tricks it can sample sounds and noises and manipulate them before replaying them at any pitch. This means it can store a sound played into it and then play it back.

Martin Rushent, a well-known record producer, is famous for his use of computers with bands like Human League and Visage. He has a very straightforward approach to technology, believing, "It doesn't make you a better carpenter because you can bash in nails with your hands ... the smart guy uses a hammer." His 'hammers' include a Synclavier which he uses with great effect to enhance sounds for most of the groups he works with.

Sampling is the most useful aspect of computer technology in recording studios. Martin Rushent sampled the sound of a live bass guitar playing a single note at a specified pitch into the Synclavier. The vital details of the sound were displayed on the monitor and at the touch of a key, the computer repeated the sound exactly. From this single note it is then possible to program the whole base part for a piece of music with no notable difference in sound than if the bass player had played it all. The bass lines are often only distinguishable as synthesised because they are physically impossible to play.

Technology increases every day and as a result of this even the sophisticated Synclavier and similar computers such as the Fairlight are being outdated. There are now modern, smaller keyboard instruments with the specific ability to sample sounds just as well as the big expensive computers. One of the latest is the Prophet 2000 which is termed as a digital sampling keyboard instrument and its sounds are stored on a 3½ inch disc. As well as sampling, the instrument can be used as an ordinary synthesiser and synthesised sounds can be mixed with sampled sounds in a variety of ways to create new and interesting sounds. Like all things, sampling has its side effects and one of the most interesting is 'stealing sounds'. Rushent admits to this and says that it goes on all the time within the music industry.

Synthesisers have come a long ways since Bob Moog developed his Moog modular synthesiser back in 1968. Today there are hundreds of synthesisers on the market, many of them specialising on specific aspects of music. Easily the most popular professional synthesiser is the Yamaha DX7 which can produce any sound by complicated programming but is also an amazing pre-set instrument. It is so popular that it is possible to play 'spot the DX7' on music programmes on television. It is used by many famous pop musicians such as Nik Kershaw, A-ha, Jim Diamond and Elton John. Other groups with extensive use of synthesisers and computers include Bronski Beat, Art Of Noise, Dead Or Alive and many more.

However obscure it seems, in fact Rushent says "composition and ideas are now more important than the ability to play technically."

Andrew Whittaker

Letters

Many thanks to Dave Hall, A Thompson, and all the other readers who pointed this out to us.

Sincere apologies are due to Tony Crowther, whose program, *Baby Monty*, appeared in *Popular Computing Weekly*, July 10 under the name Baby Mole Arcade Style, and purporting to be written by Philip Sewart!

Tony Crowther's original, as A Thompson points out, appeared in the August 1984 edition of *Personal Computer Games*.

Contributors are reminded that all program submissions should be original. To copy an article out of one magazine and submit it to another is breaking the law of copyright.

Cut price delivery

I am writing to thank you for your article on the Citizen Commodore £50 printer.

My other concern is your recent comments regarding mail order and its risks.

At the end of March I ordered a program from Cut Price software in Harlow. To cut a long story short several broken promises later I gave up hope of seeing either money or tape. However, I saw the new ad in your journal, thought 'what the heck!' and rang.

Lo and behold the gent on the other end said, 'I'll ring you back'. Ten minutes later he did, said the tape was in the post and next day it arrived!

I can only applaud his efficiency.

Gavin R McKenzie
Preston

Low-price printer

In the recent review of printers, mention was made of two low price printers, the Citizen 2-colour and the Alphacom. I believe there is another that is worth consideration in that category — the Tandy CGP 115 Printer/Plotter. This compact device is capable of producing clear and legible text in a variety of print sizes with a choice of four colours on plain 4.5 in roll paper. The smallest size of print (80 characters/line) I find particularly useful for producing compact program listings which are nevertheless clear and legible.

There are, of course limitations — printing is slow (12 cps) and by no means silent — but against this the ability to accept serial or parallel inputs and the price, just below £80 (there is another limitation, no pound symbol) coupled with the interesting graphics capability seem to me to make this device of interest to anyone whose print requirement does not justify a full size printer.

I S Colston
Bideford
Devon

Atari supporter

If you look at the Top 20 chart in *Popular Computing Weekly* you will notice that *Kikstart* by Mastertronic has been in the top five for some weeks now. You may also notice that only Atari users are buying this game in any quantity (it has stopped appearing in software charts for other machines).

So the moral is surely that there *is* a games market for 8-bit Ataris and a very lucrative one too, surely Mastertronic is reaping the rewards at this very moment. People at Ocean, Melbourne House, Elite, Imagine and even US Gold should take note. It seems ironic that the best 8-bit games computer should have so little software being developed for it when there are so many users.

If a game can reach the number one selling position from the strength of its sales for just one machine (viz. *Kikstart* and Atari) then surely this machine deserves more new software support than it currently gets.

Kirk Ruebotham
Runcorn
Cheshire

Mail order fightback

Thank you for mentioning the services of SAEC in Adventure Corner, June 26. I read with interest the editorial of that issue concerning mail-order companies and the subsequent reaction to it in *Popular*, July 10.

While there is no doubt that the practices of some mail order businesses can only be described as dubious, there is another side to this sad affair.

Here at SAEC we *never* cash a customer's cheque until the goods have been despatched. As we normally process orders by return post and always use first class post this enables us to provide a fast and efficient service.

May I assure your readers that their enquiries or orders will always receive our prompt attention.

William Young
Lanarkshire

***Popular* is on the look out for witty, pertinent or unusual letters for which we can give away a free years' supply of *Popular* binders as our Star Letter of the Week. Send your thoughts to Letters, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.**

Incidentally, if you are the author of a published Star Letter and you're wondering where the binders have got to, don't worry. We've had an administrative hiccup, but they are on their way.

Puzzle

Puzzle No 218

When Professor Otto Hex enrolled at his local Sports Club, he was allocated a locker for his own personal use.

Knowing what an extremely bad memory he had his wife remarked with some concern, 'But dear, how are you going to remember your locker number?'

'Oh its quite easy really,' replied Otto. 'You see if I take the four digits of the number and rearrange them in *descending* order, and then subtract from this the same four digits arranged in *ascending* order, the difference between the two is, curiously, equal to the original locker number. So you see, although I might forget the number itself I shall almost certainly remember the *method* for finding the number!'

Mrs Hex didn't see, but can you work it out?

Solution to Puzzle 213

Answer: The smallest dimensions possible are 183 by 198 feet, giving an area of 36234 square feet (12078) square yards.

In order to have an area having five digits the smaller side of the rectangle must be in the range 96 to 315. The larger side has a maximum size of 10% greater than the smaller. The program tests all possible values, converting the areas to a string variable in order to test that the last digit is a 4, and that there is a run of three consecutive digits in ascending numerical order (lines 60 to 120).

```
10 FOR S=96 TO 315
20 FOR L=S TO INT(1.1*S)
30 P=S*L
40 IF P<10000 THEN 140
50 P$=STR$(P)
60 T=0
70 Z=VAL(MID$(P$,5,1))
80 FOR N=1 TO 3
90 V=VAL(MID$(P$,N,1))
100 W=VAL(MID$(P$,N+1,1))
110 X=VAL(MID$(P$,N+2,1))
120 IF W=V+1 AND X=V+2
    AND P/9=INT(P/9) AND
    Z=4 THEN PRINT S,L,P
130 NEXT N
140 NEXT L
150 NEXT S
```

Winner of Puzzle No 213

The winner this week is R Marshall of Cheltenham, who will be receiving £10.

Rules

The closing date for puzzle 218 is August 19.

The advent of the Dos system

A few years ago both Digital Research and its Z80 operating system, CP/M seemed decidedly on the back burner CP/M had been accepted as the industry standard for 8 bit micros but the arrival of IBM's PC sporting Microsoft s MSDOS left DR apparently as the proprietor of a product that was being fast outmoded, and with no obvious way of breaking back into the big time

This, however, is set to change with the advent of Dos Plus 1.2 a new operating system from DR designed for use on cheap, mass-market IBM PC compatible machines It will be licensed by PC manufacturers rather than sold in the shops, but its very existence is an indication that at least one company thinks PC compatible sales are poised to take off

The company s strategy since it lost out

"The new system is a link between the products DR has been producing."

to Microsoft has depended on two main factors First it has identified areas its multi-tasking operating system, Concurrent CP/M can be used for specific PC-based tasks thus allowing it to chisel away at the edges of Microsoft and IBM s markets and second it has been more aware than most business software and hardware companies of the way the home and business micro markets are drawing closer together

DR President John Rowley was for example talking about the IBM PC becoming a standard for home micros *last* Christmas – it seemed improbable then but with the impending launch of the Amstrad PC the odds are now at least even

Gem, DR s Graphic Environment Manager has been of crucial importance in the company s plans to address the home/business merger It was initially launched on the IBM PC ahead of Microsoft s rival product, Windows but its appearance on the Atari ST has meant DR has re-established itself as an operating system supplier for a mass-market micro, a handy incidental to this being that the ST's market doesn't clash with IBM's or Microsoft's

But even without Amstrad's input predictions throughout the industry are that prices of IBM PC lookalikes will fall drastically over the next year bringing the machines much more into the mass market. To cover this market the company therefore needed a mass-market operating system that would run on the IBM PC and that is basically the rationale behind *Dos Plus 1.2*

The new system is essentially a link between the various products DR has been producing over the last few years In its simplest form it is a compact (90K) operating system largely compatible with MSDOS, and running the vast majority of programs written for the IBM PC It will also run programs written to operate under CP/M-86 DR s largely abortive attempt to transfer CP/M s success from Z80 machines to those based on the 8086 series of chips used by IBM, and is therefore a bridge of sorts between MSDOS and CP/M Don t go running away with the idea this will let it run programs written for CP/M-80 machines like the Amstrad PCWs – it won t, but it should make transfers a little easier

For the end user this advantage may be a little remote, but another function of the CP/M compatibility is that it allows a measure of multi-tasking, running a maximum of one foreground and three background programs MSDOS-based programs can only run in the foreground but programs written under CP/M can occupy either foreground or background The examples included give you an idea of how far the multitasking goes – the system comes with an alarm you can set to remind you to make that crucial call, and a print spooler, allowing you to print out files and use other programs at the same time It would be possible to use the multitasking facilities to perform more complex tasks, but this will tend to slow the machine down and make heavy demands on Ram so the facility is much more a frill than a major feature

With some machines Dos Plus 1.2 will be supplied on its own, but other manufacturers are likely to bundle Gem and DR's *File Manager* program with it. The Amstrad PC, it is thought, will include both Dos Plus 1 2 and Gem as an 8086 equivalent of GemDos the 68000 operating system used by the Atari St in the form of TOS It should be remembered that Gem is technically a graphic front end not an operating system and prior to Dos Plus 1 2 was supplied to run on top of MSDOS on the IBM PC and its clones

File Manager is a different kettle of fish, presenting you with a screen display of several windows, which allows you to run programs and various file management commands by a combination of cursor controls and the return key It s similar to IBM s *Topview* and in my humble opinion is similarly Mickey Mouse, but it gives licensees something to build on, and allows DR to keep its options open should IBM ever wish to incorporate *Topview* into a PC operating system

On its own Dos Plus 1 2 incorporates both the advantages and the disadvantages of MSDOS and CP/M. It's compatible with the tree structure directories used by the more recent versions of MSDOS which allow you to create directories within directories so that your disc files can be organised more logically, while CP/M contributes disc partitioning, allowing space on drives to be apportioned to different, notional discs In addition CP/M allows

"Dos Plus has it's applications in networking"

password protection of files so although Dos Plus is billed as a mass market, single user operating system it has applications in networking, where hard disc partitioning and password protection are important On the minus side it has limitations on file specification and incorporates the confusing aspects of MSDOS and CP/M that systems like Gem are designed to avoid, but this is the price of compatibility

So will Dos Plus become an operating system as familiar to the home user as Sinclair and BBC Basic? The answer is dependent on two factors First, PC compatibles must become cheap enough for them to be adopted by home users in the same way as the Amstrad PCW has been and second DR has to sign up a couple of mass-market PC manufacturers to supply the system with their PCs In an ideal world of course a good operating system would sell on its own merits but in the real world success is more dependent on marketing

The most obvious vehicle for the system s success will be the Amstrad PC – if that takes off then DR will be back in the big league and can reasonably expect other manufacturers to take the system on board But even if this does happen that won t be the end of it Microsoft is thought to be in negotiation with Amstrad over future developments, while Dos Plus, consisting as it does of two operating systems, must to an extent be a transitional phase Can CP/M follow up its success in the 8 bit market by taking over from MSDOS? Tune in next year

John Lettice

Infra-red Spectrum keyboard is revolutionary

After a substantial advertising build-up, the SAGA 2001 remote infra-red keyboard for the Spectrum is here – and what an odd kettle of fish it is. Unlike most replacement keyboards, the 2001 is used completely separately to the Spectrum itself, rather than having the Spectrum PCB mounted inside. The 2001 consists of two main units: the keyboard and an interface box.

The interface, about the size of a cigar box, is attached to the Spectrum's user port by a ribbon cable leading to a connector. On the front of the interface is an infra-red sensor.

As for the main keyboard unit, it's massive – around 470 × 210 × 35mm – and features two infra-red transmitters on the back. These allow you to type quite happily on one side of the room, while the receiver picks up the information on the other side with no physical connection.

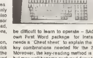
Because the keyboard needs an internal battery to operate there's an on/off switch mounted on the back. The keyboard can be attached to the interface using a cable provided to recharge the battery, which should last for around a month between charges now that the internal design has been refined to use only one microprocessor. This cable also allows you to use the keyboard in a more conventional way should you carelessly allow the battery to become flat.

The design of the 2001 is revolutionary in other ways too. The *Symbol Shift* function has been designed out in that all the secondary functions have been relegated to a row of nineteen special keys along the top of the board, which are accessed using a right-arrow key and/or *Shift*.

The main section of the keyboard features a full-sized space bar but hopelessly under-sized *Shift* keys. There are also *Graphics*, *Edit*, *Caps Lock* and four cursor keys. To the right is the numeric keypad, with 0-9 *Left/Right* cursor, maths functions, *Del* and *Enter* keys.

So apart from the infra-red function, which in my opinion is more of a gimmick than a necessity, what is the design of the 2001 meant to offer? The thinking behind the mechanical design is to create a keyboard which is familiar to typists and word processor operators, pushing the specialist programming keys out of the way to tidy up the design. To back up the concept, the electronics are arranged so that the Sinclair key codes are transmitted during the refresh cycle of the computer, making this the fastest-operating Spectrum keyboard I've come across.

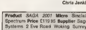
The 2001, then, is designed for use by small 'business' users who need a familiar fast-operating keyboard to use with a budget computer. But there are problems. For instance, removing the *Symbol-Shift* functions means that some software might



be difficult to learn to operate – SAGA's own First Word package, for instance, needs a "Cheat sheet" to explain the new key combinations needed for the 2001. Moreover, the key-reading method is fast, but may well become confused if you try to press more than one key at a time, for instance in playing some games.

Overall, then, the 2001 is technically clever, well constructed, and works very well. But the infra red function strikes me as a redundant gimmick, and at £119.95 I really cannot see that the 'small businessman' using a Spectrum will want to dig that deeply into his pocket.

Chris Jenkins



Product *SAGA 2001* **Micro** Sinclair Spectrum **Price** £119.95 **Supplier** Sage Systems, 2 Eve Road, Woking, Surrey, GU21 4JT, 04862 22977

New Timatic disc drives for Amstrad

Timatic Systems has released two makes of 5¼ inch second disc drives as add-ons for the Amstrad computers, based around standard Pace switchable 40/80 track drives with the appropriate interfaces and driving software.

The Timatic Bigdisc for the CPC range fits exactly the same way as a normal second drive – a ribbon connects to the computer and the drive has its own power supply.

The first advantage over the normal drive is that the software allows you to get a much higher capacity out of the discs – under CP/M 2.2 or Amsdos, and of course CP/M Plus, you can use 80-track single sided discs to get 400K of formatted storage per floppy. Under CP/M Plus only a maximum 800K of formatted storage is possible using 80-track double-sided discs. Before it can be used in either of these modes a small program has to be run to install the drive.

The other big advantage is that because 5¼ inch is such a standard disc size you are half way to being able to read/write discs from other makes of computer. You can fit the discs into the drive, the only obstacle to using them is the probable difference in formats. A formatted disc has been divided into a number of segments, like pieces of an orange seen in cross section. To find a given program the computer looks up in the directory which tracks and which segments the file is held in. Unfortunately there is almost no common standard in disc formats over CP/M machines and the number of segments varies enormously.

Traditionally the standard way of transferring information from one make of machine to another has been via an RS232 serial link, a process that logically shouldn't be difficult but can cause endless headaches. However even if you have the required interfaces and software it is only a viable option if you have both computers together in one room or can organise a modem link – what about the business users who want to bring some work home from the office to their own machine?

The Timatic drive comes supplied with some format options and utilities that will allow you to read and write 40-track IBM CP/M 86 format and also some more obscure alternatives. An optional extra is a program called *Chameleon* that will make many more CP/M computer formats open to you. It is extremely simple to use and can program either drive A or drive B into a variety of formats (although only drive B is 40/80 switchable). Once installed the data can be accessed and altered as much as you wish (as long as you also have a program that can make sense of it, for example).

Also supplied are some disc utilities including alternatives to *Pip*, *Dir*, *Com* and *Disckit* to make backing up simpler from the large capacity drives.

The PCW 8256 version is an alternative to the 3 inch second disc drive that is many times simpler to fit yourself than the official one – you do have to remove the back of the computer, invalidating your guarantee no doubt, but all that has to be done is to thread the disc drive cable out through the hole in the case where the printer plugs in – there seems to be sufficient room to do this without worrying about squashing the cable when it is all re-assembled. The only tricky part is getting the screws out of the back of the PCW.

The Timatic drive rests to the side of the computer next to the printer and again has its own in built power supply, although it does slightly spoil the one plug simplicity of the machine. A major plus to Timatic

was that the thing came with power plug already fitted

Owners of an 8512 will know that the large capacity second drive really comes into its own when you are running some of the top of the range CP/M software – an 800K disc lets you store a huge database or almost a book from your wordprocessor rather than a chapter or two

Alternatively you could have *Newword*, the spelling checker, and a large document all together on one disc making life very simple indeed Some programs such as *dBase* really need this capacity to *work* properly at all

The PCW disc drive does not come supplied with a choice of formats as the CP/M software is already set up to drive it at 800K double sided storage However you can again buy *Chameleon* to allow you to play with lots of different formats

Both disc versions are also supplied with a special MSDOS file transfer utility It doesn't exactly let you read an MSDOS disc but files can be transferred onto an ordinary Amstrad format disc and used from there, and of course you can send them back again This feature may obviously become particularly important when Amstrad releases its PC but will already be of value for people who are using an IBM at work with, say *Wordstar* or *Newword*

In the past it has been a fashionable thing to do to attack Amstrad for its choice of 3 inch drives because they are 'non-standard' etc Whatever really was Amstrad's reason for the choice I find myself fully supporting them – the 3 inch CF2s are almost indestructable compared to 5¼ inch floppies and even 3½ inch ones and they strike me as being perfect for the average home user Also judging by the price cutting that was going on at the last Amstrad show any shortage of the 3 inch discs is now over with

However they are still extremely expensive compared to the 5¼ inch size and in particular the double density type for use with the one megabyte drive of the PCW cost an absolute fortune Using Timatic's drive may therefore pay for itself eventually in saved disc costs although my distrust of the floppies would make sure I used 3 inch ones for backups Given the other benefits available as well I would suspect that this is an add-on that is hard to resist for those who need a second drive

Tony Kendle

Hardware *Timatic 5¼ inch disc drive* **Micro** Amstrad **Price** £149 Amstrad CPCs, £209 Amstrad PCW, 8256/8512 **Supplier** Timatic Systems, Fareham Market, Fareham, Hants PO16 0LB


Amstrad PCW 8256 – now an alternative 5¼ inch drive is available

Robtek Magic Disk Kit is a wonder

Apart from being horrifically slow and the size and shape weight of a breeze block, the Commodore 1541/1570 disc drives have another major fault This may leave you wondering what good they are at all but while there s not much you can do about the shape, several companies Robtek included, have produced utilities to improve the speed Now Robtek's *Magic Disk Kit* tackles the third major problem, head alignment.

Most copy-protected discs cause the read/write head to knock against the end stops of the disc drive, causing a terrible noise and inevitably eventual misalignment. This plus problems with the speed of the drive, are the major causes of drive failure and before now have required *very* expensive maintainance if anything went wrong

Robtek's disk contains four major sections The first allows you to change the device number of the drive in use, so that if your drive is so knackered that it will not even load the Robtek utility you can load it from another drive

The second is a speed tester, which runs the drive for half a minute and produces a graph showing how close it gets to the optimum 300 rpm Any significant deviation, and the program tells you to adjust the speed

The third program tests head alignment by producing a track list which is matched against the track number that your drive is actually scanning, Again if there are significant errors the program tells you that adjustment is necessary

The manual gives you full details on how to carry out the adjustments, but does include an awful misprint which led me to spend half an hour poking at the top side of the drive PCB rather than the bottom Sort that out for the next edition lads

Magic Disk Kit also contains a head cleaning disc, and a driver program which just whirls it around for thirty seconds After using the Kit on all my disc drives, I m now much more confident of their efficient operation and feel that any 1541/1570 owner would consider Robtek s product money well spent Now if only they could make the disc drive smaller

Chris Jenkins

Program *Magic Disk Kit* **Micro** CBM 64/1541/1570 **Price** £19 95 **Supplier** Robtek, Unit 4, Isleworth Business Complex, St John's Road, Isleworth Middlesex TW7 6NL 01-847 4457

Speech conversion speaks for itself

Superior Software s *Speech* was originally designed for the BBC, and has now made a successful transition to the Commodore 64 and the Amstrad CPC 464/664/6128, on cassette and disk

Speech is in fact a fairly standard voice synthesis program, running from software rather than from the more familiar cartridge format pioneered by the Currah Microspeech, Cheetah Sweet Talker, and so on

The 9K program is loaded first. then there are three demo files to study; one which goes through the capabilities of the program, one a simple spelling-test program, and the last which enables Ascii text files to be converted to speech

The quality of the speech itself produced by modulating the output of the sound chip using frequency patterns based on the 49 common English phonemes is no better or worse than any other comparable product. In other words it sounds like a Dalek gargling with marbles However this is part of the charm of such products, what s the point of having a speaking computer which sounds like Kenneth Kendall – it's much more fun if it sounds like a computer

Speech uses three main commands *Say*, which makes the machine speak anything typed into it, *Speak* which allows you to input individual phonemes for more exact pronounciation and *Pitch* which changes the clocking rate, and thus both the speed and pitch of the speech The Amstrad version also has left/right/centre stereo settings

The test of a good speech synthesiser is its ability to handle ambivalent words like "through" "tough", and "rough" Speech handles it fairly well, "through" comes out more like "throw", but this is where the *Speak* command with its individual phoneme pronounciation and pitch comes into its own This also enables you to make the computer "sing" although using the *Say* command with separate words is much too slow

Speech can be used with your own Basic programs though as far as I can make out it's not possible to create free-standing speech files Nonetheless, for all kinds of serious applications, and also for a good laugh, Speech is an excellent and reasonably-priced package which should provide hours of education and entertainment.

Chris Jenkins

Program *Speech* **Micro** CBM 64 Amstrad 464/664/6128 **Price** CBM 64 tape £9 95, disk £14 95, Amstrad tape £9 95, disk £14.95 **Supplier** Superior Software, Regent House Skinner Lane, Leeds, LS7 1AX 0532 459453



Fun and graphics in The Art Studio

Peter Worlock creates on the Commodore 64

It is one of the oldest questions in microcomputing. The sphinx of ancient Greece would accost unwary travellers and pose the problem: what else can you do with a micro apart from play games?

The hapless travellers would mumble something about balancing their chequebooks, at which the sphinx would emit a gleeful cackle and hurl them to their doom. Until the fateful day when Perseus turned up with a graphics package tucked in his corselet and despatched the sphinx with a quick thrust of a joystick.

Graphics packages have since enjoyed a runaway success (as proved by the total lack of sphinxes these days). And, short of a £20,000 CAD terminal, one of the best to date is Rainbird's *The Art Studio*. A smash hit on the Spectrum, it has now been converted to the Commodore 64 and it deserves equal success there.

Features

The Art Studio is closely modelled on the Apple Macintosh style of graphics presentation. All activities are controlled by an on-screen pointer which selects various drawing tools, as well as fill patterns, colours and other features. The outstanding attribute of *The Art Studio* is the way in which it manages to combine ease-of-use with power and flexibility.

Every conceivable feature is present. There are line, box and circle tools, pens and brushes for freehand drawing, an array of textures and patterns for fills. You can designate windows in any part of the screen and then perform a variety of operations on these windows.

Sections can be shrunk or expanded, flipped horizontally or vertically, inverted and so on. Most art packages offer some kind of zoom facility, but none does it as well as *The Art Studio*. You can select any area of the screen and magnify it 2×, 4× or 8×. The screen converts to a window on the whole picture and you can easily move around the document, touching up the fine detail.

Finally, you can obtain hard copies of your masterpieces on a dot-matrix printer. *The Art Studio* supports any kind of printer thanks to an installation program which allows you to configure the system to suit your own needs.

> *"The Art Studio allows you to configure the system to your own needs"*

Problems

All of which is not to say that *The Art Studio* is perfect. There are one or two problems but – to be fair – these are largely external to the software. For example, colour handling is hampered by the limitations of the 64's high resolution screen. You get a total of 16 colours, but only two can be used in any 8×8 pixel block. If you're not careful this can make a mess of a picture.

Other programs overcome this by using the 64's multicolour graphics mode, which reduces horizontal resolution by half while gaining the ability to use four adjacent colours. The ideal solution is to offer the user the choice, but *The Art Studio* confines you to high-res mode.

Also, to get the most from the program you need either a mouse or a graphics tablet such as the Koalapad. You can use keyboard or joystick, but the limitations make it a frustrating experience.

However, again in defence of Rainbird, the company is offering a discount mouse as part of the package. Buyers of *The Art Studio* can order a high-quality, optical mouse for only £30.

The Art Studio's disc filing menu

Conclusion

The Art Studio is perhaps the best solution for anyone looking to employ their 64 or C128 in graphics applications. It isn't a design package – which means it isn't ideal for producing technical drawings and diagrams – but it's marvellous for creating on-screen paintings.

Your creations can be loaded into your own programs through Basic or machine code loaders, making it ideal for designing title screens, or illustrations for graphic adventures. In any event, it's a lot of fun.

Program *The Art Studio* **Micro** Commodore 64/128 **Price** £14.95 cassette, £17.95 disc **Supplier** Rainbird Software, 74 New Oxford Street, London WC1





An example of *The Art Studio's* output


MISSION
OMEGA
You must not fail. Omega came from outer space. No-one knew anything about it, but it threatened mankind.
You have been chosen to explore and detonate this alien intruder. You can call upon a selection of robots, each with its own unique characteristics and each invaluable. But, you only have one hour . .
CBM 64, Spectrum 48K and Amstrad: £9.95
GAMES
Argus Press Software Ltd.,
Victory House, Leicester Place,
London WC2H 7NB.
Tel: 01-439 0666
In case of difficulty, Mission Omega can be obtained from Argus Press Software Ltd., Units 1 and 2, Conlon Developments, Watery Lane, Darwen, Lancs. BB3 2ET
39 02

Bugbyte's Cricket – a sticky wicket

BBC and Electron owners now have a choice when it comes to cricket simulations, with both *Ian Botham's Test Cricket* (which looks like the nearest that the Great Man is going to get to a test match for some time to come) or the more modestly titled *Cricket*, from the reborn Bug Byte

Bug Byte is obviously not expecting very high playing standards from its game, since this is village rather than test cricket on one player mode you play against the Merry Hackers, in two player mode you play against a friend

When fielding, you get to set your field and from thereon you control only the bowler, defining whether to bowl fast, slow or spinners, and using keyboard or joystick for the run-up and delivery

You may as well know now that your fielders are abut as nippy on their feet as shop window dummies that is they just stand there while perfect catches skim two inches away from their noses I can't work out how you're supposed to catch any batsman out, in fact since even when the ball falls into their hands (and stays there) the batsman cheerfully carries on. The lack of an umpire sprite is obviously to blame

Batting mode is just as frustrating The *Popular* office went through two copies of *Cricket*, without being able to get anyone to bowl to us However we are reliably informed by the cassette inlay that you press *Space* to play your shot

The graphics are pretty crude, with some horrendous attribute problems but after all, *Cricket* is only £2 99 But if you want to buy a cricket simulation for the *BBC/Electron* take a good look at both titles on offer before making a choice

Popular Appeal ◆

Christies Erskine



Program *Cricket* **Micro** BBC/Electron **Price** £2 99 **Supplier** BugByte, Victory House Leicester Place, London WC2

Amused, confused and delighted on the Mississippi

Of all the numerous software houses competing for our trade Activision must rank as one of the top few who consistently release innovative software After such gems as *Little Computer People Alter Ego* and the excellent *Borrowed Time* they are once again ready to amuse confuse and delight you with *Murder On The Mississippi*

All the joystick controlled action takes place aboard an old Riverboat christened "Delta Princess" and bound for New Orleans You adopt the role of Sir Charles Foxworth sleuth extraordinaire Accompanied by your faithful manservant Regis, you must solve the murder of one of the passengers before the boat reaches its destination

To do this you guide Sir Charles around the boat, question the ludicrous characters you meet and examine everything in sight Keeping notes on suspects is as easy as falling off a log thanks to the on-screen notebook and can be referred to at any time

Graphics are very good and the animation of the main characters as they trundle around the ship opening doors, climbing steps etc, is a joy to watch all in all a refreshing bit of nonsense guaranteed to please most people

Popular Appeal ◆◆◆◆

Roger Garrett

Program *Murder On The Mississippi* **Micro** CBM 64/128 + Disc Drive **Price** £14 99 **Supplier** Activision, Pond St Hampstead, London NW3.

C16 duo is "pure arcade gold"

Jeff Minter's old Vic games hold up well in the light of history since they rely perforce on imaginative game control and fast action rather than on particularly whoopy graphics Converting them for the C16 isn't then such an odd move considering that much of the C16 software around at the moment falls on both counts

Matrix is a demented form of Centipede, with your fighter ship moving around a grid fending off attacks from multi-segmented aliens bombs pods, cameloids zappers, and a traitorous human which sets you up to be zapped by enemy gun emplacements The action gets amazingly fast and with the addition of reflectors, anti-matter pbos and bonus screens it should keep you occupied for hours Still one of the classic zappers

Laser Zone fares less well, for some reason the conversion is blobby and uninteresting to look at Here you have two gun bases one moving left-right and one up-down with which you must destroy all the aliens entering the laser zone You have electro-zaps (smart bombs) to get you out of trouble but the real test comes when an alien lands on the gun rail and starts inching its way towards you You must master the tricky diagonal shot to blast it off the rail

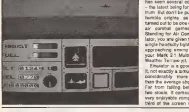
As a package pure arcade gold Go for it

Popular Appeal ◆◆◆◆

Chris Jenkins

Program *Matrix/Laser Zone* **Micro** C16 **Price** £6 95 **Supplier** Ariolasoft/Llamasoft, 68 Long Acre, Covent Garden, London WC2

Spectrum game is an Ace conversion



Ace strangely enough, started life as a C16 game and since then has seen several conversions – the latest being for the Spectrum But don't be put off by its humble origins as *Ace* has turned out to be one of the best air combat games around Standing for Air Combat Emulator, you are given the task of single handedly fighting off the approaching enemy forces in your Mark 2 1 Multi-Role All-Weather Terrain jet.

Emulator is a good word for it, not exactly a simulation but considerably more involved than the average shoot-em up Far from falling between the two stools It comes out as a very enjoyable romp The top third of the screen shows the out of the cockpit view which features some of the smoothest and fastest action I've ever seen on a flight game, the lower portion being devoted to various displays and read-out A total of nine difficulty levels means this one isn't going to lose its appeal quickly and with the option of having a friend join in as weapons firer/navigator, even at the price (and even with that blasted Lenslok four tries before loading!!) it's highly recommended

Popular Appeal ◆◆◆◆

John Cook

Program *ACE* **Micro** Spectrum **Price** £9 95 **Supplier** Cascade Games, Harrogate, HG1 5BG

Mandragore: a laugh or a bore?

How would you like a weekend in a French chateau? Yes I thought you would, and so would I which is why I looked with more than passing interest at *Mandragore* the first program from Infogrames a French software house now selling to the UK The only trouble is, of course that this chateau is not a very restful place instead it's your typical dank rat-infested monster-ridden heap which seems to be just sitting around waiting for an adventurer like you! And it just one of several dotted about the landscape of Mandragore, each of which holds a dark secret to be winkled from the shadows and fleeting wraiths

I first saw this game on the Commodore and the thing that struck me then was how much like the *Ultima* series from Origin Systems the American company it was

The quest is undertaken by four characters and these may be named and defined by you, or you may accept the built-in profile which comes with the program

This is a typical party of human, elf wizard and thief, each of which has a certain quota of points covering the well-known intelligence strength experience and so on all of which should be pretty familiar to anyone used to Dungeon and Dragon-type games in general (though it should be stated now that *Mandragore* is really not at all like that classic) and *Ultima* in particular

Once the party is selected, you'll find yourself in the land of Mandragore, and it is now up to you to explore the landscape in search of weapons, food, spells treasure and so on

At first the screen display depicts your party, in the uninspiring shape of a matchstick person, jerking character-square by square around a badly-scrolling landscape of symbolic marshes, mountains and lakes Dotted around this Lego-like landscape are several villages (type *V* to enter) and chateaux (type *C*)

The scene will then change to show each character under your control and any objects and other characters at the location

At villages, you may buy, steal or barter for, equipment, food, weapons, and medicine and converse with shopkeepers and doctors The castles are where the serious monster-bashing and treasure-getting takes place, although each of these must be loaded in separately which is a bit of a chore even for disc owners for cassette users this facet of the game is interminably dull

Utilising the various attributes of your party can be quite intriguing though the strategy and adventuring aspects of the game leave a lot to be desired I'm afraid to say and these are the very things I was looking forward to seeing Generally the program looks very dated with commands being input via the keyboard rather than the joystick, and awful blocky graphics looking more like a Commodore game of three or four years ago

The manual is helpful, but tries to cater for every version from Commodore to Amstrad and Sinclair as well as Apple and MSX which makes things very confusing Several chapters of story preface the instructions, and these apparently contain useful clues to use in the main game, but the story reduced me to helpless laughter long before anything of worth could be extracted from the Franglais the proof reader is obviously Benny Hill's scriptwriter (come on Infogrames even Bram Stoker wouldn't have dared to use "viscous humours")

Popular Appeal ◆◆

Tony Bridge

Program *Mandragore* **Micro** C64, Amstrad MSX Apple II **Price** £14 95 **Supplier** Infogrames 23-25 Castlereagh Street, London W1H 5YR



How to score at Green Beret



Tony Kendle welcomes a partial solution to Imagine's Green Beret... plus an offer of help for Batman

My lack of Rambo-like qualities when playing *Green Beret* has prompted this reply from Gert Guttmann of West Germany As Gert begins, "first of all I must say my English are not so good" I have summarised his letter

Gert has found a poke for endless lives which is *Poke 41652 0 Poke 41654 0*, but it only works with Multiface One attached as breaking into the game normally has proved too difficult. For the lucky people who have the aforementioned device you can also try *Poke 36798 0* for endless lives on *Batman*

Using his poke Gert has completed the game

' Most of the batcraft parts are in blind alleys and one in a hiding place You will not be able to get them without the four pieces of bat equipment shown on screen The hidden piece is in a room with three tea cans and a bubble with a question mark in the middle Use the tea cans to bump the question mark through the hole in the middle of the screen and a part will appear

"Walk along the bottom until you meet the man firing the mortar. Frazzle him."

"It is too difficult for me to give the whole solution in English but anyone with problems or who wants a pen pal can write to me at Mont-Cenis-Str 530 D-4690 Herne 1, West Germany

Writing with more tips is an old correspondent, K Petrussewicz, trading this time under the name of Bones As you can I get anywhere with *Green Beret* I have decided against my better judgment to help even though I haven t finished the game yet.

'Level one the missile base Walk along the middle level killing everything until you kill the *second* commander (I don't remember it being that easy!--TK), then walk along the bottom until you reach the man firing the mortar Frazzle him As long as you don't use the weapon more than twice you will (when you reach them) be able to frazzle the mines by the lorry by lying down and firing When you receive your next weapon then blast any jumping soldiers After the next commander save this weapon Carry along blasting and killing the soldiers until the background stops moving and the lorry comes past (why doesn t it run you down?) Then more soldiers come so fry them then get hopelessly drunk and continue on to

"The soldiers seem to be camouflaged, as it is hard to see them."

Level two, the harbour this is when the game gets hard because of the nasty position of the mortars When you reach the first one move along the top until you get the weapon (rocket launcher) then go down to the bottom killing off the mortars (there are two at first) then kill the next commander and the second set of mortars You will then reach a large two level building Climb to the top and run along till you reach the end Stand on the edge and wait until a soldier with a parachute turns up and kill him Fall off (when it is safe) and run along to another identical building and repeat this process This time save your weapon using it only to kill the flying soldier

Run along the bottom until you reach three mines Destroy these and carry on running (after disposing of the mortar man) you should reach a submarine and the screen will stop moving

Turn to the left of the screen and hold the stab key down until the dogs are gone and turn round and lie down until again holding the key down When this group of dogs are gone then get up and turn round again etc until they stop coming after you You should have around 50 000 points and you will be taken to

Level three the bridge this can be tricky because you have to use grenades These have some good points because if you fire one, everything above you will also be killed, but they are very slow to fire

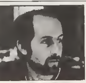
Anyway, climb up the ladder until you kill the commander then go along the bottom killing off the mines and mortars saving a grenade for when the commander turns up As you can kill people above you with the grenades you will not have to climb the wall Eventually you will receive a flamethrower so kill the mortars with this, try to blast the mine and mortar with the same shot by the white building Save one shot Climb to the top and run along until you reach the end Kill the flying man with the flamethrower and jump off the building when safe

' Run along and when you reach the white wall Climb the ladder You will be in front of a background of trees and the soldiers seem to be camouflaged as it is hard to see them (a very clever touch) When you receive the weapon (rocket launcher) don't use it – run along the top until you reach the bridge Fall off the wall (when safe) and run until the screen stops moving Run to the left when the helicoppers come down When one reaches your level shoot him and run to the east When the other two come down kill them You have now reached the

"Fourth Level, the prison camp this is a very awkward place Go along the bottom using grenades to kill mines, mortars and kommie kangaroos *Don t* climb up on to the higher levels Soon you will end up by a white wall like the one in Level Three Climb up on top of it Kill the commander and carry on This wall will end and a low building follows which you can t climb on There are some mines and mortars which you can kill

"I carried on from here and found a wall but it had a low house the same height following it. Then I saw a red wall like the one shown at the beginning of each stage then I died!

' So there you are (Very welcome indeed Bones) But before I go I thought I would mention some strange things about *Turbo Esprit* sometimes you see cars driving on the wrong side of the road causing long traffic jams and if you stop in certain places the whole traffic system comes to a standstill!



Bargain basement for adventurers

Tony Bridge looks at a selection of budget-priced adventures, and a range of handbooks

While talking about all the fanzines and adventure clubs that have appeared just lately, I forgot, or rather delayed, to mention that *Adventure Handbooks* from H&D of Manchester. The solutions contained therein rely, as do those in most of the other magazines, on the input received from readers. Thus the style of individual entries vary between the severe blow-by-blow with no explanation, and the more detailed 'how and why'. H&D manages to pack a vast amount of information into each issue, and £1 for each handbook of 40 plus pages is good value.

Arcade fans are catered for, too, with a separate handbook for each of the more popular machines. The handbooks are among the best available, stuffed full of maps and information about adventures, but they have taken things a step further than others in releasing a collection of adventures of their own. On tape, *Quill'd* and for the Sepctrum only (as far as I know), the four games in the collection are all written by Walter Pooley, whose name is often seen in the handbooks as a provider of many of the solutions which are so helpful to adventurers.

There are four games on the tape, and each one offers a different challenge. *Desert Island,* for example, is an uncomplicated and straightforward adventure which should suit beginners. Here you'll find all the usual problems, like digging up beaches, opening lockers and assembling hammer, nails and planks to repair a bridge. It shouldn't take too long for an experienced player to work through this one, but for a novice, the atmosphere conjures up a nice picture of an island in the grips of the US-Japanese Pacific War. It also serves as a nursery adventure, featuring many well-known puzzles and a couple of medium-difficult mazes.

Mansion Quest is a "Hunt the treasure and the will in the old house" story, and is another fairly friendly game, again featuring some chestnuts which will be warmly familiar to old adventurers.

Mission X is the spaceship/aliens/computer/laser pistol contribution to the collection, and is logical and interesting to play, with lots of objects quite close to the locations in which they must be used, while the 'rescue the princess' department is handled by the final program in this collection, *Castle Adventure* (of course). This is the hardest of the quartet, though it is still fun to play, and matching the found objects to their allotted task is satisfying. There is the occasional rough edge, of course, as we have come to expect from *Quill'd* games (you'll come across good old Hugh Boulder in the course of your wanderings, though upon examination he turns out to be just another old huge boulder).

The tape, at £4.95 (just over a quid an adventure!), hint sheets and handbooks are all available from H&D Services, 1338 Ashton Old Road, Higher Openshaw, Manchester M11 1JG.

One or two budget labels are doing well with *Quill'd* adventures, and one of these is Atlantis Software. I particularly enjoyed *Marie Celeste* and *Mafia Contract* – now Neil Smyth has written *Mafia Contract 2*. It is *Quill'd, Patch'd* and *Illustrated,* and 'written, produced and directed by Neil Smyth'. This is a novice's adventure, with puzzles that shouldn't frustrate anyone for too long, but the game makes much use of the newer *Quill* techniques, such as Ramsave and load, Picture and Sound on and off and a chunky character set as well as dynamic Help.

You are a henchman of Don Copolla, who is having a lot of trouble with arch-rival Vito Rossi. But Copolla now trusts no one and has even put out a contract on you, his former right-hand man – this has persuaded you that the only course open to you is to take over the whole organisation, and eliminate the two bosses. The story opens as Rossi's men break into the house of intent on vengeance.

The pictures are not too inspiring, being standard illustrations, and I still find the need to press a key to clear the screen a little tiresome. It's a bit much, I suppose, to expect pictures in a *Quill'd* game to change in order to reflect the text – in the first location, for example, opening the drawers in the desk doesn't alter the firmly closed drawers of the illustration.

Although there is a lot of business about men rushing about and enemy hoodlums attacking your men, again there's nothing to be seen on the graphics, which doesn't do much for the atmosphere. But, apart from the main location graphics, which take up the whole screen, there is also the occasional small graphic illustrating, for example, a wire fence, a Model 10 Ingram machine rifle and so on. As to the puzzles, well, they're not very taxing, you'll find keys and locked doors, meat and killer dogs, gloves and electric fences and the rest.

So the adventure seems to be a good introduction to the pastime: the pictures aren't state-of-the art, and location descriptions are not very inspiring. Nevertheless, you'll find some good atmosphere and a lot of suspense, as you come across bands of Rossi's 'soldiers' – how to deal with them? You have to be quick! At £1.99, the features of the program and the story line make this well worth a look.

Also at £1.99, and again from Atlantis, is *Return from Ithica*, the story of Odysseus' return home from the Trojan wars to his beloved Penelope. This is an exciting tale and has been the subject of many films, as well as Homer's *Odyssey*, of course – and this is not, I might add, the first time that the computer has seen the story either, as my good friend Mike Gerrard and brother Pete have also tackled it (available for the Commodore from Duckworth Software).

But the present implementation, written by Liddle and Kesson, is one of the best adventure you'll find at this price (and it is the equal of many others at many times the price): the graphics aren't flashy, though they are competently and quickly drawn and also contain the occasional clue – the text is brief, but again, you'll find subtle clues which will help you on your way.

The puzzles aren't mind-bending, but careful (and mercifully, not too lateral) thought about the objects available to you should eventually get you through seemingly impassable obstructions an on to more locations and more objects. The first scene is typical: a sword lies in a fire, and must be obtained – searching your inventory reveals that you are wearing a helmet. This can be used as a container for sea water, which will extinguish the fire.

This program was brought to my attention by Hugh Walker, who says: 'Good is not the word to describe this adventure, Brilliant, more like! Seldom in the history of adventure has so much been offered for so lithe.' That's praise indeed, and I must say not *too* hyperbolic. Of course we all like the blockbuster new releases, but there is always a need for mainstream adventures such as *Return of Ithica*, and Atlantis seems to be doing a very good job along with one or two other houses in this regard. I look forward to seeing the next release from this pair of authors, which, we're told, is the story of *Beowulf*.

POPULAR Computing WEEKLY



BUSINESS COMPUTING

INSIDE

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Making room for a ROM Interword's advanced facilities for the BBC

Business software or serious software is regarded by many micro owners as the only valid reason for owning a computer – just as some will only be interested by games software.

However there isn t such a sharp distinction in the marketing of most machines they are sold into both areas, and most would claim to serve as "business" machines to some extent, some more convincingly than others

The Amstrad PCW series is perhaps the first affordable micro which is unequivocally designed for business use – so does this mean that the serious side of software has now come to dominate the whole industry?

Whether you are used to using IBMs in work or more used to zapping aliens than programming spreadsheets, this supplement should help you to make more of the serious side of computing. ◄

The rank and file

TONY BRIDGE ON THE LATEST VERSION OF CAMPBELL SYSTEMS' POPULAR MASTERFILE DATABASE FOR THE AMSTRAD CPC 6128

The most respected database system for the Sinclair machines was *Masterfile* from Campbell Systems some three or four years later, it is still around and converted for the Amstrad PCW and CPC series. It's easy to see why this program is so popular extremely well-programmed (it runs under AMSDOS so there are none of the usual installation problems encountered with CP/M) and very robust, there seems to be nothing that Campbell Systems have not thought of in making the program as friendly as possible. Although the facilities within the program are impressive one of the most endearing features of Campbell's programs is the constant updating, polishing and embellishment. Before we get to look at the latest version of *Masterfile*, however let's take a quick trip round the basic program.

Layout

Many database programs heve the failing that they offer fixed field lengths, limiting your screen layout options.

Masterfile approaches the screen layout design in a very flexible fashion for a start, the length of each field is entirely flexible, so that you can type in data of any length (up to a maximum of 240 characters, which ought to cover *any* surname!) Not only that, but you don't have to design your screen until after all the data has been typed, if you wish and not only that, but you may have many designs, each taking information from the same set of data.

To enter data, it is necessary to define at least one "data name", this is the equivalent of a field and won't appear on the final display being merely a signpost by which the program finds this particular field. Each name is given a one-character reference (for ease of use, normally letters of the alphabet, but most of the characters on the keyboard can be pressed into service), so that, in compiling your name and address file you might use A for the first name, B for surnames and so on. Over 50 such names, or fields in more usual terms, may be used but don't worry if you forget what they all stand for – a list of names and a short description can be displayed as an *aide memoire*. So now, data can be entered and records added one by one to the main file. It's an easy matter to add new names at a later date, or simply to insert a unique name into just one record if desired – all of which would be extremely difficult if not impossible with most "card index" databases. Staying with our example of the address file, you may decide after entering 50 records that you would rather like to

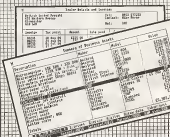
see details of birth dates. Simply insert a new "name" and carry on as before.

While entering data, you may use several special commands. for example, there's no need to stick to the usual conventions such as "Jones, Fred" and "Smith Joe" for the entries to be sorted properly, by surname – *Masterfile* requires a backslash ("/") thus: "Fred/Jones" At display time, the backslash becomes a space, while the sorting process looks first at Jones. A shifted 0 (zero) will force a line-break on display: while this makes for a pleasant display, it fulfils a much more important purpose. Our 'card index" database will require an address for example, to be spread over 4 or 5 fields, labelled "address 1" "address 2' and so on, eating up a lot of memory *Masterfile* allows you to type "36 Damson Lane_Hungriton_Eton", which will appear as

36, Damson Lane
Hungriton
Eton

with optimum usage of memory.

As with every other aspect of this package, designing your screen layouta is made as easy as possible for you. The first thing to decide is where on the screen the various fields should appear: the heading assigned to each field of data is entirely up to you and can be changed at any time. Then lines can be drawn on the screen to make a more attractive layout; again, this can be altered at any time to reflect new headings. While designing the screen, you can flick back and forth between the display itself and the design format, making instant changes.



Relations

One of the most important facilities available (and certainly the most unusual at this price) is that of "relational data" To make a change from our address file consider a file containing details of your music albums. If you're an avid fan of Oscar Peterson, *Masterfile* will save you all the trouble of typing in his name over and over again Simply define "Oscar Peterson" as a Parent with all the titles of his albums, and titles contained therein if you wish, the Children of that Parent. Now, instead of typing the name in full for each disc (and of course, your favourite artist could well be the Old Etonians' Philharmonic Orchestra and Choral Society, which would *really* be a chore!), all you need do is type a simple two- or three-letter mnemonic. Not only does this save finger-wear, but it also represents a significant saving of memory.

So you can see that *Masterfile* is more than just a simple electronic filing cabinet although all databases allow the data to be searched for relevant information *Masterfile* also allows the data to be *displayed* in a variety of ways, and allows complete sets of data to be merged together, making it one of the most flexible packages around

Through its system of nested menus (and a very helpful Help menu), the program strives to be as friendly as possible, allowing for colours to be changed, printer controls to be sent, keys to be re-defined (so that searches, for example can be initiated with one key press) as well as allowing the user to drop into Basic for customisation of the program Further, data may be easily sent to *Protext* and *Tasword* for more sophisticated Word Processing, or to *ProMerge* for use in personalised letters and so on.

Although I've only used fairly frivolous (though quite legitimate) examples so far, it is perfectly possible to use *Masterfile* in a more serious context; indeed, numeric fields can be used in very complex computations. This, together with the almost unlimited range of screen designs, should prove very useful to the businessman

Version III is a great improvement on an already superb package. There are several changes that are immediately apparent to the long time user of *Masterfile*: menus have been prettied-up with 3-dimensional shadows, data entry and editing are both easier and more attractive than before, and file operations (Loading, Saving and so on) are very much faster than before. Several new options are available during the display sequence, including instant switching between reports, and the highlighting of target records

Included on the disc along with several well-planned and illuminating example files are several utilities: using MATCH, you can transport one set of data from a file to another file with matching records so that a file containing names and addresses may be merged with a file of names and telephone numbers, resulting in a file containing names, numbers and addresses; probably the most impressive and useful utility is the Spectrum-to-Amstrad data transfer program. Now you Sinclair owners don't have any excuse not to update!

Manual

Finally, the ring-bound manual, which was vastly improved for *Masterfile* Version 2 *n*, is now even better, with key by-key examples and plenty of useful pokes. Also on the disc you'll find instant updates to the manual which can be printed and kept for future reference

Although *Masterfile* is about to be released for the PCW series, I haven't seen it on that machine, but I can assure you that you may buy it sight unseen – if it is anything like the CPC Version III, you'll not want for anything else. ◀

Get to work on time

NOW THE COMMODORE 128 HAS ITS OWN SUITE OF INTEGRATED BUSINESS PROGRAMS

TONY HARRISON-SMITH CHECKS OUT TIMEWORKS

Soon a new name will appear in the UK computer software market, **Timeworks**. This American company concentrates on "Productivity Software", and is now releasing UK versions of packages including **Word Writer 128, Swiftcalc 128,** and **Data Manager 128**. All the packages reviewed link with each other to give a fully integrated suite of programs, the first we've seen specifically for the C128

The programs provided for review were US versions. The only real problem with this was the American dictionary with the Word Writer 128, and the American examples and spellings in the manuals. Timeworks say that in the UK versions, the manuals will be re-written to a more English style.

Monitor

Timeworks Swiftcalc 128 is a spreadsheet, and it requires an 80 column monitor to be used. Swiftcalc 128 has a grid of 256 rows by 256 columns and it will allow the usual values and labels to be stored in the cells. The maximum length of the formulae in a cell is 240 characters. This allows very complex formulae to be used. Unlike most programs, the formulae in Swiftcalc can be edited using the cursor keys to correct the area required without rewriting the whole lot. To make the entry of commands easy for the new or casual user, Swiftcalc 128 uses pull-down menus and has limited help screens.

The rows and columns can be frozen to act as title areas and also cells can be locked and unlocked to protect data from accidental erasure. Cell widths can be altered either over the whole spreadsheet or in just a block of columns, and can be adjusted to any size between 3 and 20 characters. Data in the spreadsheet can be copied, moved and sorted, as well as searched and replaced with other data. An unusual feature which is only usually found in the more expensive business packages is the ability to set a cell to a value and then have automatic incrementing of the value in successive cells. This can save a lot of time when creating lists of dates, values etc which have a standard increment between each value.

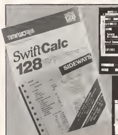
Swiftcalc 128 has many ways of displaying the spreadsheet data. The actual data can be printed out in the normal manner as with all the spreadsheets available. Swiftcalc 128 also allows the data to be printed **sideways** on a dot matrix printer. This allows a wide spreadsheet to be printed whole, rather than having to divide it into separate segments as normally happens. Swiftcalc also has the ability to represent the spreadsheet data in the form of graphs. The graphs available are bar chart, 3D bar chart, scatter chart, line graph, pie charts and exploded pie charts. The graphics can be dumped to a matrix printer but cannot be saved to disc. I have produced very impressive 3-D bar charts on a Commodore MPS-801.

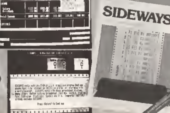
One of the main selling points of this package is the fact that it can be used as part of a integrated system. Swiftcalc 128 can receive data from the Data Manager 128 database as long as the data was saved into a file especially for use with Swiftcalc 128. This has the disadvantage that you cannot suddenly decide to extract data from the database. To get the information you have to load Data Manager 128, save the data you want into a file and then reload Swiftcalc 128. Areas of the spreadsheet can be saved as a special ASCII file for use with Word Writer 128. This will allow you to produce letters or documents with a table of values at the end of it.

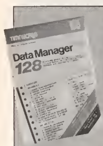
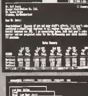
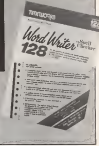
Timeworks' Word Processor is called Word Writer 128. This is very easy to use, as it incorporates the same system of pull down menus as all the other Timeworks packages. Unlike Data Manager 128 and Swiftcalc 128, Word Writer 128 will work in either 40 or 80 column modes. In 40 column mode several of the advanced features of this package cannot be used.

Insert

Like most good word processors Word Writer 128 will allow text to be moved around, copied to another area and new text inserted into the existing document. To allow for corrections a "search and replace" function is also included. Headers and footers can be set as well as up to 14 tab





positions. On startup there are 8 preset tabs in position, but these can be cleared and reset to your own requirements.

Word Writer has several advanced features built in. It is able to accept data and text from the two other packages in the suite, Data Manager and Swiftcalc. When editing a document up to three different fonts may be used, boldface, italics and underline. The difference with other word processors is that the different types of fonts can be viewed on the screen before printing. This gives a far better idea of what the finished document will look like, before wasting a lot of paper printing it out. There is a built in calculator which is very useful for doing calculations and entering the result into your document. (This can only be used in 80 column mode.) When writing a lot of text which uses indented paragraphs, an automatic indent function can be used. This really becomes useful when the words automatically wrap round at the end of a line. For the use of standard paragraphs or such like word Writer 128 allows the merging of files into the main document.

Document

When it comes to printing out the document, several parameters may be set. These include justification, sheet feed, line spacing, number of copies, secondary address and top and bottom margins. The print option will also allow the printing of a standard letter with the names and addresses taken from a sequential file set up by either Word Writer 128 or Data Manager 128. For special printers, control character sequences can be set to utilise the printer's capabilities.

Data Manager 128 is a powerful database with many features, and like all the other packages reviewed it uses pull-down menus. One of the main requirements for databases is security of data. To provide this there is a password system included in this package.

Records

This is not a totally secure way of protecting data, but it will stop the average user from accessing any data which they are not supposed to see.

Data Manager 128 allows records of up to 100 fields with a maximum field length of 251 characters. The total record length is 4096 characters, and can be split over more than one screen. There are several field types allowed including alphanumeric, numeric and date.

A unique feature of this package is that a record can be made to simulate a small spreadsheet with calculation from column to column and field to field. Data Manager 128 allows the use of statistical functions within a record format. The functions offered are sum, average and standard deviation.

Records can be retrieved by a number of ways. The first and quickest way is by record number. Unfortunately this is usually the last bit of information known! The other methods of retrieval are by Field contents, data range and amount range. With all these methods the upper and lower limits of the search range can be specified. Data manager 128 has also got an additional search feature: this is called cross searching (X-search). When using X search, you can set your initial search parameters as normal and the list of records fitting these parameters will be created. X-search will then allow you to re-search only the records in the list list created for the next set of search parameters. This can be repeated several times, until the record required is found.

To make the database more logically ordered, there is a sort facility which will arrange the records in ascending or descending order of a given field in the record. This will improve the speed of any reports that access the database in a sequential order. The reporting of information from the database can be achieved in two ways. The first method is to use the built in report generator. This will allow a report to be compiled using selected fields from the records and print the data held in those fields. The second method of showing the data held is by using the graphics commands. This will give a coloured bar chart of values held in the records.

Value

In conclusion, for about £60 each these programs are reasonable value for money. The set of packages when used together are claimed to be particularly suitable for small business use. I think that this is a fair statement. It would be nice if there was also an accounts package for this suite, but that would just be the icing on the cake. The main feature that will really sell these packages to the small business is that there is a free technical help phone number that will answer any problems! ◄

Programs: Word Writer, Swiftcalc, Data Manager

Micro: CBM 128

Supplier: Timeworks, PO Box 453, Maidenhead, Berks, SL6 1ST Tel. 0628 74678

Price: £59.95 each

INTER-WORD

INTER-WORD is the third in the ROM-LINK series of application programs for the BBC Micro-computer and this is the most ambitious suite of programs to be written for this machine. Each part of the suite offers a superior alternative to the competition. As a complete integrated suite of programs there is nothing better available for any micro computer.

INTER-WORD is the newest and the most comprehensive word processor ever produced for the BBC Micro.

•Part of the only truly integrated suite of programs for the BBC micro. This enables **INTER-WORD** to run alongside the other members of the ROM-LINK family such as INTER-SHEET. Multiple documents (together with sheet data etc.) can be held in memory at the same time and data transferred from one to another.

•Truly WYSIWYG. i.e **INTER-WORD** shows an accurate screen representation of the final printed page at all times.

•Supplied on a special 32K ROM, the chip is compatible with all machines.

•Supports 40,53,80 and 106 column screen modes with either 25 or 32 lines on screen.

•Compatible with BBC B, B+, Master, Aries, Watford and now Solidisk shadow RAM boards.

•Multiple column printout and multiple copy options.

•Mail merging facilities built in. Allows merging from another **INTER-WORD** document or from other INTER programs such as INTER-BASE

THE NEW WORDPROCESSOR FOR THE BBC MICRO

The ROM-LINK suite, of which INTER-WORD is an important part, is a uniquely flexible set of integrated ROMs, compatible with all models of the BBC micro

MONEY BACK

Guarantee

The first published review of INTER-WORD says:

"the most significant program since WORDWISE"

"INTER-WORD on the BBC Micro compares favourably with word processors costing five or ten times as much running on the IBM PC and the like."

"INTER-WORD was a real pleasure... a truly worthy successor to WORDWISE"

Gordon Taylor A&B Computing

•Built in support for different printers. There is no need for additional printer drivers, as the user can define the codes required for bold, underline etc. Once defined for a particular printer these codes can be saved for later use. Like WORDWISE, INTER-WORD also has the ability to send any control codes to the printer at any point in the line, thereby giving access to all its features.

•Powerful search and replace facilities include wildcards, and a case sensitivity control. There is also a quick 'go to' search option.

•Special attention has been paid to screen update speed, ensuring this is one of the fastest screen editors around. There is no waiting around for the text to reformat.

•If the page size is changed, or the margins are altered, all text is re-formatted to the new settings instantly

•Any specified part of text, page or range of pages may be printed (or spooled to disc) via simple to select menu options.

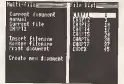
•Fully compatible with DFS, ADFS, ECONET and any other Acorn compatible filing systems.

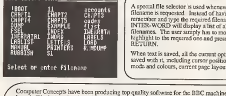


The format of text in INTER-WORD is controlled by rulers rather than embedded commands. A ruler can be inserted at any point simply by pressing a single function key. This ruler will affect the format of all text after it. By simply dragging the margin or tab indicators on the ruler all text controlled by this ruler is instantly re-formatted to the new settings.

INTER-WORD supports documents much larger than memory. This special 'multi-file' mode is both simple to use and far superior to other forms of continuous processing. By linking a list of files together INTER-WORD is able to treat these as if they we just one long piece of text.

The multi-file menu allows the insertion and deletion of any file and the printing of the whole document.





A special file selector is used whenever a filename is requested. Instead of having to remember and type the required filename, INTER-WORD will display a list of all the filenames. The user simply has to move the highlight to the required one and press RETURN.

When text is saved, all the current options are saved with it, including cursor position, screen mode and colours, current page layout etc.

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Amstrad leads the way

TONY KENDLE LOOKS AT THE LATEST AND BEST SOFTWARE FOR THE UBIQUITIOUS AMSTRAD PCW8256/8512

No prizes for guessing that this is an electronic diary program from the makers of the Tasword word processor. What did surprise me is that it is such an attractive and easy to use program that it overcame my conviction that pen and paper is really the only sensible option for a diary. Still in the long run it may prove to be something for true VDU freaks only.

The main screen layout consists of a window of diary text and four surrounding box displays showing the current options, the date and time and the calendar for the current month. This calendar is programmed correctly from 1753 (don't ask me why) up to December 2100 – long enough for the most ambitious of us I expect.

The diary is accessed from disc on a month by month basis and data can easily be inspected or edited into a given day as long as you have the appropriate password. You can also use a search option that incorporates wildcard characters to track down certain entries. Any displayed page can be printed out.

I do feel that more work could have been got out of the computer to justify the effort of loading up the disc. One idea for example is that you could record appointments with some sort of 'alarm status' so that when you log on the time and date a warning can be given of important events coming up that week.

However, on the whole it is an attractively designed and good value utility that should do well. ◀

Program *Tasdiary* **Micro** Any Amstrad CPC with discs **Price** £12.95 **Supplier** Tasman Software Ltd, Springfield House, Hyde Terrace, Leeds LS2 0LN

Releasing a new word processor for the PCW machines is a bold move even when the program in question is very cheap and also successful on other machines. What features are there available with Tasword 8000 that would attract users away from the familiar Locoscript?

Firstly Tasword is a remarkably easy program to get to grips with – the help menus are so self evident and extensive and the options available so straight-forward that there is almost no need to refer to the manual at all.

This is not to suggest it is unsophisticated – indeed it is an improvement on the Taswords released to date, it is faster and has some welcome additions – you can embed markers in the text, for example, to help you move around quickly, merge files at the cursor position, and the find/replace is vastly improved.

The display is completely 'what you see is what you get' and you can use the arrow keys to get anywhere you like on the page to begin typing – just like a pen and paper. It's a small point but impossible on most word processors and a very friendly feature for beginners.

Locoscript has many excellent features – templates, embedded format rulers, multiple block storage, alternate header footers etc. – but Tasword can challenge these with a word count, four notepads for jotting reminders, an extensive scientific/foreign character set and two extra fancy fonts supplied for printing.

Tasword works with pure ASCII text which makes it suitable as an editor for program listings etc, and at least readable by almost any other utility available. It is also invaluable for editing and re-formatting any ASCII files you may have created by transferring data down a modem or between different utilities.

A quite sophisticated mail merge option is capable of making tests on the data supplied to decide what to print. The only feature this lacks is the ability to re-format the text prior to printing meaning that a ragged right edge is inevitable.

Perhaps its greatest strength is the fact that the Ram of the M drive is used by the program for directly storing the text as you type it. Very large files can thus be created: about 100K on the 8256 and over 300K on the 8512. Because text is held in RAM, moving around large files and making changes is very much faster than with Locoscript or any other word processor I know.

TASPRINT 8000
THE STYLE WRITER
FOR THE AMSTRAD PCW8256 AND 8512

Tasprint 8000 supplies another six fonts that can be used with Tasword directly with any ASCII files or via a sort of direct 'typewriter' option. ◀

Program *Tasword 8000/Tasprint 80000* **Micro** Amstrad PCW **Price** £24.95 & £14.95 **Supplier** Tasman Software Ltd, Springfield House, Hyde Terrace, Leeds LS2 0LN

Regular readers will know that I have already given an enthusiastic review to Prospell in its CPC incarnation so I won't go on again at great length here. This version of Prospell has been written to run under the CP/M+ operating system which means that it will also work on the CPC 6128 but in truth it has really been designed with the PCW computer in mind because it is designed to work with files produced by the Locoscript word processor.

Prospell will handle ordinary Locoscript documents (not just page image files) in any group and to any length (if the file is very long and you are trying to



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```
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E - Edit dictionary
L - List dictionary
F - Find words
A - Anagrams
P - Printer on/off
W - Count Words in dictionary
N - Change Name of dictionary
I - Initialise new dictionary
B - Build dictionary
C - Catalogue files

STOP to return to main menu

Select Command: █
```

run everything in one drive you may have to change discs a couple of times – but then long files are a nightmare to create with Locoscript anyway so you may not have these problems)

As well as Locoscript documents Prospell will also handle Wordstar/Newword format and ASCII text (e.g. Tasword 8000 or any plain CP/M text editor) and it is very fast.

Unrecognised words can be changed, viewed in context, ignored or you can even ask Prospell to attempt to find the words in the dictionary that you have been trying to spell in the first place

The correct spelling of words can found using wildcards for letters you are unsure of (also useful for crosswords), there is an anagram finder and also options for editing the dictionary, adding new words etc. Different dictionaries can be created e.g. for different technical subjects.

Prospell can not correct mis-spelt words that happen to form something else that is elgal, e.g. Oxen and Oxon, but even the most diligent proof readers miss things – especially if you are 'convinced' you know the correct spelling. I've found it an absolutely invaluable aid so far and I'm sure it will be a boon to many Locoscript users. ◀

Program *Prospell* **Micro** Any Amstrad **Price** £29.95 **Supplier** Arnor Limited, The Studio, Ledbury Place, Croyden

As its colourful name may suggest The Cracker is no ordinary spreadsheet, it is one of those rare breed of programs that have been subjected to a major rethink about how they should be made to work to suit the average user

If you are looking for a spreadsheet that can just do lots and lots of number crunching The Cracker is probably not the most powerful program you can buy: it is certainly more limited in size than say Multiplan, giving you a maximum of 52 columns, 255 lines and 18K of data. However this is probably adequate for something like twelve month financial reports and the program also has a selection of powerful features that in my opinion make it one of the best buys around.

Perhaps the most notable feature is that it is extraordinarily friendly and easy to use. Every command you type, using a single letter keyword mnemonic system, is checked as it is entered to see that it is both legal

OPINION POLLS
Comparison of Pollsters
Percentage support
40
30
20
10
0
MORI
NOP
GALLUP
MARPLAN
Pollster
Conservative
Labour
Alliance
Others

and makes sense in terms of the sheet you have defined so far. If an error is found an explanatory message is displayed on screen (in English rather than the normal CP/M garble). If that still isn't enough help screens can be called up at any time.

The Cracker also keeps track of the logic of the sheet you have defined – it gives each entry a rating for order of re-calculation to ensure that only after any changes only one calculation is necessary to ensure a correct result. It may sound an obscure point until you have tried using a program that doesn't have this feature. Similarly you cannot remove data if a calculation somewhere else in the sheet depends on it to make sense, at least not without first confirming that this is really what you wanted to do

Other strong features are some nice graph drawing functions (high quality screen display and also hard copy) which are extremely simple to use, much easier than DR Graph for example (although The Cracker can also feed data directly to this program as well!) Database functions will let you sort and search things like names and addresses and even print mail labels.

There are also I/O port controlling options – build a loop containing inbuilt date and time options and it can control your lights whilst you go on holiday

An ordinary spreadsheet it isn't, versatile and friendly it is. ◀

Program *The Cracker II* **Micro** Any Amstrad CP/M + **Price** £49.00 **Supplier** Newstar, 200 North Service Road, Brentwood, Essex.

Colleen's Payroll System was originally intended to see the light of day as 'Amsoft Paymaster', but Colleen has now taken the decision to market the software under its own name and seems to be offering a remarkable bargain

The payroll system is intended for small and medium sized companies. It can handle records for up to 500 employees in up to 10 departments.

The Payroll System is fully protected by a password routine, and includes a help file which can be accessed before you plunge into the main program

The program is set up by entering the start date, then details of the company, tax district, numbers and names of departments, details of employees and so on. New departments or employees can be inserted at any time – and also deleted

Payments can be calculated on a weekly or monthly basis, and the program takes into account complexities such as Statutory Sick Pay, holiday pay, P45s and so on. The Colleen Payroll System comes with a substantial 60-page manual and is also available in a version tailored for Southern Ireland. At the price – £29.95 – it appears to represent remarkable value for money, and should fulfil all the technical and legal functions required of any payroll package. ◀

Program Payroll System **Micro** Amstrad PCW **Price** £29.95 **Supplier** Colleen, 18 Bishop Street, Penygraig, Tonypandy, Mid Glamorgan, 0443 435709

An excellent example of a program written for a vertical market, Supernews from Bubblebus fulfils a very specific purpose, yet has a large enough potential audience to keep the price down to acceptable limits.

As its name implies, the program deals with administration for newsagents, and can save hours of work every day by automating the process of compiling delivery lists and handling customer accounts.

Supernews has been updated and adapted from versions for CBM and Einstein machines, and the PCW version includes many improvements suggested by users of earlier versions. For a start, it's designed to be used by computer-naive newsagents, the RETURN key is used to select options, rather than making the user direct a cursor around the screen to select options.

There are two major file structures, for customers and for publications. The customers list is divided into rounds, and includes details for name and address, holiday "stops" substitutions in the case of publication being unavailable, charge rates for delivery, state of credit and, of course, all the daily, weekly or monthly publications ordered.

Up to 400 publications can be listed by number, with full details of supplier, retail cost, wholesale price, number of copies required, and so on. The newsagent has an option to print out the wholesaler's order each day, and can also use the rounds list to calculate whether the cost of paying delivery boys is being covered by the delivery charges – something which is often too complicated to calculate by hand.

Supernews includes many options which would not occur to the uninitiated user, but which makes all the difference to the newsagent; order requirements for future weeks special routines to cope with time-specific weeklies like the Radio Times, reminders of overdue accounts, a sale option to put small purchases from the shop onto a customer's account, special accounts for such things as Christmas clubs, and so on. At £190 + VAT the program might sound expensive by home computer standards; but to the overburdened newsagent, whose only alternative in the past has been to invest in an expensive system such as Apricot or Tandy, the PCW micro and Supernews makes an economical combination.

```
ROUND  1 WED   25/06/86
------------------------------------------
12 HIGH STREET          1 SUN
                        1 GARDEN WEEKLY
------------------------------------------
16 HIGH STREET          1 SUN
                        1 THE TIMES
                        1 TELEGRAPH
------------------------------------------
THE GEORGE HOTEL        3 SUN
                        3 THE TIMES
                        1 TELEGRAPH
------------------------------------------
TOTALS FOR 3  CUSTOMERS
 5      SUN
 4      THE TIMES
 2      TELEGRAPH
 1      GARDEN WEEKLY
------------------------------------------


ROUND  2 WED   25/06/86
------------------------------------------
1 LOWER ROAD            1 SUN
------------------------------------------
149, Maney Hill Road    1 TELEGRAPH
------------------------------------------
160 Maney Hill Road     1 SUN
------------------------------------------
TOTALS FOR 3  CUSTOMERS
 2      SUN
 1      TELEGRAPH
```

Example 3D Bar Chart

2000
1800
1600
1400
1200
1000
800
600
400
200
0
Jones
Smith
Johnsen
1983 1984 1985 1986 1987 1988

Bubblebus hopes to produce more similar programs for vertical markets such as hotels garages, video shops and so on. With the increased penetration of the PCW, the market for such vertical programs is growing as never before ◄

Program Supernews **Micro** Amstrad PCW **Price** £190 + VAT **Supplier** Bubblebus, 87 High Street, Tonbridge, Kent, TN9 1RX, 0732 355962

Compact Software's extensive range of IBM PC programs are now to be made available for the Amstrad PCW machines.

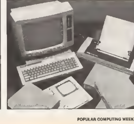
Distributors such as Rowtall Computers will be selling the Compact Accounts package at £199.99 Compact Accounts includes sales ledger, invoicing, purchase and nominal ledger routines, and can transfer data to popular packages such as Supercalc, Multiplan, Wordstar, Newword and Cracker.

Compact accounts claims to contain everything necessary to run a small to medium sized business, maintaining records of all customers, transactions, invoices, statements and debts. The separate modules are available individually at £69.99 each

Also available are Day Book, Stock Control, Payroll and "Nucleus" program interfacing packages. At around a third of the price of identical IBM programs, the Compact range is backed up by training courses from West Midlands dealers Rowtall Computing ◄

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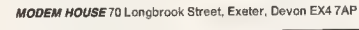
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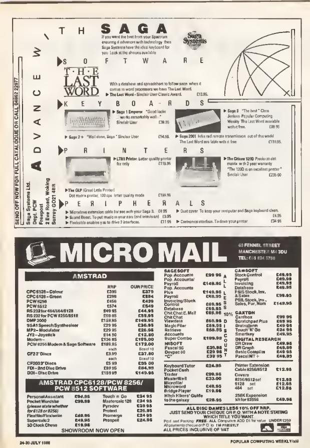
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Four ROMS en suite

Successor to WordWise, InterWord offers BBC users integration and a host of new features as Cy Noble finds out

Here is yet another word processor (WP) from Computer Concepts, whose **Worldwise** is probably the most widely used WP for the BBC computer Their second was **Worldwise Plus**, which is a souped up version of the original, and very good it is too Now comes Inter-Word, and you may be wondering why

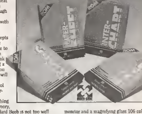
The answer is that Computer Concepts has a suite of Inter-roms which can all use the same data sets and do much more than a straight WP can. Others in the suite are **Inter-Sheet** (a spreadsheet), **Inter-Chart** (does graphs and pie-charts) and, in the pipeline is a database **Inter-base** There is also a spelling checker which works with all their roms.

Computer Concepts ideal is that you can produce business reports incorporating tabulated figures from the spreadsheet, illustrated with graphs and pie charts produced by Inter-Chart using the figures from the spreadsheet, and text from the WP All of it in one integrated document because any rom in the suite can use commands processed by any other rom in the suite.

Brevity

At this point I must say that the manual is very cursory not friendly enough It confuses me in parts and I'm a fairly experienced programmer The information is all there but brevity seems to be the order of the day I could not get some commands to work and that is probably the fault of the manual. Also, 'Wordwise' seems to be unhappy about having Inter-Word in the same computer I lost the first copy of this review, using 'Wordwise to write it, with Inter-Word still aboard

In order to integrate the program with the other roms in the series, it is not possible to load 'Wordwise text directly into Inter-Word So if you already have either of the previous word processors from Computer Concepts,then you will need to use a small Basic program, printed in the manual, to prepare a new version. This strips all the embedded control codes from the text so you will then have to go through the text again replacing them with the Inter-Word equivalents. If Computer Concepts wants Wordwise users to upgrade to Inter-Word then they should think about supplying a proper conversion program which will replace the Wordwise control codes with Inter-Word ones.



This sort of thing uses lots of memory, which the standard Beeb is not too well endowed with so they recommend a shadow ram board if you intend to produce large documents. However, there is a multi-file option whereby a document can be split among a related set of files and the WP will shuffle them back and forth automatically as you edit. Nevertheless you are warned to keep an eye on how much memory each individual file uses and always leave plenty of leeway for additions. As these files can be on more than one disc there is no theoretical limit on the size of a document.

What you see is what you get, and in this respect Inter-Word is hard to fault. The screen even shows underlining and bold text where these options are selected No printer control codes are shown in the screen text, and what you see on screen is how it will look on paper The character 'under' which a control code sequence is hidden will be shown reversed, ie black on white rather than white on black as normal

An interesting point is the choice of 40 53, 80 and 106 columns of text with 25 or 32 lines of text on screen. With a good monitor and a magnifying glass 106 cols is useable if you are addicted to eyestrain. Better to use a lesser width and select the number of columns you want to use when you're ready to print

Tabs and margins are set using the cursor keys to pick and drag symbols on a 'ruler' at the top of the text. This 'ruler' is effective down to the next ruler which you can insert and manipulate where required. Up to sixty rulers' can be used to manipulate the text to your satisfaction This feature is a joy to use.

Windows

You can select the 'ink and paper' colours for your own comfort and switch the interface on or off from within the program. and these are really useful if you spend long hours slaving over a hot computer If the width of your page is wider than the screen width selected then you get a sideways scroll until you get to the edge of the page and automatic word wrap takes you on to the next line.

Everything is menu driven using that flavour of the year, pull down menus in windows, where the cursor is used to highlight the option you wish to select. With the multiplicity of menus it is sometimes difficult to remember which one offers the option you want. Some of the commonly used ones are duplicated on the function keys. This approach is fine for the beginner, but gets a little tiresome when you have to wade through menus within menus to reach a simple option

Inter Word is certainly an advance on most other WP packages, but I would argue that simplicity can be a virtue.◄

Floating Point Numbers

by S McCarthy

Storing integers in computer memory is a fairly straightforward affair Simply decide how many bytes you require to hold your number in its binary format and *Poke* the values in When it comes to decimal fractions however, the subject becomes more complicated

The Spectrum system uses 5 bytes to hold decimal fractions and integers which may be required for arithmetic manipulation Slipped in at the end of Chapter 24 of the manual is a rather inaccurate account of how it does this Reading this we find that

Any number (except zero) can be written uniquely as–

+/−M*2↑E

Where +/− is the sign of the number

M is the mantissa and 0 5 > = M < 1

E is the exponent , a whole number (possibly negative)

This is a very convenient way of expressing numbers as far as computers are concerned, as the binary system used in memory storage is of course, base 2. This means that for any byte in memory, its value can be calculated by taking each bit value (0 or 1) in turn and multiplying it by 2↑bit power Bit powers correspond to bit positions, so that bit 0 has a power of 0 bit 1 a power of 1 bit 2 a power of 2 and so on Therefore a byte containing 10011001 is broken down as

Bit 0 1*2↑0 (rightmost bit)
Bit 1 0*2↑1
Bit 2 0*2↑2
Bit 3 1*2↑3
Bit 4 1*2↑4
Bit 5 0*2↑5
Bit 6 0*2↑6
Bit 7 1*2↑7 (leftmost bit)

Look at the calculations on the right of the list and you will see the similarity to the above equation +/−M*2↑E The convention is one already in use by your computer

So given a number, A how do we convert it to floating-point format? The program listed here does this for you, giving the resultant 5 byte values as used in the Spectrum system The steps which it goes throughout are explained below

The first thing we must do is to strip the number of its sign and convert it to an absolute value So now we have S holding the sign, +1, −1 or 0 and A being equal to *ABS(A)*

We now have to find the values for the mantissa and exponent in our expression Having two unknowns makes life a difficult, but knowing that any number raised a power of zero=1 we can start with an exponent of 0 and a mantissa equal to our number The expression then becomes A*2↑0 2↑0=1 and A*1=A so the expression results in our original number (ignoring the sign)

Now we know that the mantissa must be greater than or equal to 0 5 and less than 1 If our number already lies within this range, then we have found the required values for M and E If not, we have to adjust M and E until it does The result of the expression must always be our original number and the way that this is achieved is to double M (if it is less than 0 5) and decrease E by 1 or halve M (if it is > =1) and increase E by 1 This will always give the same result and the process is repeated until M falls into the required range

Having found the values for M and E in the expression, we now have to change the mantissa, M to binary format As M is a fraction > =0 5 and < 1, we need a binary fraction also We have seen how an integer is expressed in binary and is represented by bits being successive negative powers of 2 So 2↑−1 = ½ = 0 5, 2↑−2 = ¼ = 0 25 2↑−3 = ⅛ = 0 125 etc Outwardly of course, there is no difference in appearance between integers and fractions when stored in memory but a programmer decides before writing his or her program the way in which numbers are handled, and this determines whether a byte is a fraction or an integer The convention for writing binary fractions is the same as in decimal i e to precede the fraction part of a number with a point Therefore 1 in binary means 2↑−1 which is 1/2 or 0 5

The program converts the fraction to binary by taking decreasing powers of 2 starting at −1 and seeing if the result is greater than the decimal fraction. If it is, the relevant bit is set to 0 If not the bit is set to 1 and the decimal fraction is reduced by 2↑power where power is the power of 2 so far reached The process is repeated until 32 bits have been considered and our 4 mantissa bytes are complete The 33rd bit is then calculated and if it is 1 the mantissa is rounded up (1 is added to it)

Note that the Spectrum manual is incorrect in rounding up the mantissa in its example The 33rd bit is 0 when 0 1 is converted to a floating-point number and the final bit in the mantissa should be 0 not 1

Having calculated the binary format of our mantissa and carried out any rounding necessary, we must now consider the sign The mantissa we know, is equal to or greater than 0 5 As the binary for 0 5 is 1 the first bit of the mantissa will always be 1 The Spectrum therefore uses the bit to denote the sign of the number (0 for positive 1 for negative) For any calculations, the sign is considered first and a 1 written to the first bit of the mantissa to get back to the original value So we must also amend the first bit according to whether our original number was positive or negative

This is the final manipulation of the mantissa Now we must consider the exponent Because it can be negative the Spectrum stores it as exponent+128 This allows the exponent range −127 to 127 Adding 128 to our exponent, then gives the required value Our exponent can now be written to the first byte of the number, and the 4 bytes of the mantissa to the following 4 bytes This gives us our 5 byte floating point number

The Spectrum uses a simpler format for small integers (whole numbers between −65535 and +65535) as follows

1) The first byte holds zero
2) The second byte is zero for a positive number and 255 for a negative one
3) The 3rd and 4th bytes hold the less and more significant bytes of the number (or the number+65536 if negative) (N B not number+131072 as in the Spectrum manual)
4) The 5th byte holds zero

When a value is input to the program the expression is printed with decimal values and evaluated to check that the solution equals the original value The binary values of the exponent the mantissa before rounding, the mantissa after rounding and the mantissa after sign amendment are given together with decimal values in brackets

As the program reproduces the Spectrum's way of sorting numbers, any number which will not fit into 5 bytes will stop the program with the error message 6 Number Too Big

The program can be restarted by typing *Run* and *Enter*

The question now is what use is all this? Apart from throwing light on how the Spectrum deals with floating-point numbers the method used can be applied to any computer and indeed any programming language So, for example, it would be possible to write routines to manipulate floating-point numbers using an integer Forth language or in machine code to improve on or expand the Spectrum routines perhaps to give greater precision in mathematical calculations

```
980 REM ********************
981 REM *Decimal input into s*
982 REM * sign in S ...     *
983 REM *containing power and *
984 REM * binary strings.   *
985 REM ********************
```

continued on page 26 ▶

```
1000 INPUT AT 0,0;"Enter your decimal number: ";a: CLS : PRINT "Program converts decimal numbers to 5 byte floating point format": PRINT : LET s=SGN a: LET a=ABS a: LET power=0: LET b=a: LET a$="00000000000000000000000000000000": LET e$="00000000"
1002 REM ************************
1003 REM *Treat zero separately*
1004 REM ************************
1005 IF b=0 THEN GO SUB 5200: GO SUB 5000: GO SUB 5010: GO SUB 5020: GO TO 1000
1006 REM ************************
1007 REM *   Deal with  small   *
1008 REM * integers' >-65536 &  *
1009 REM *      <65536          *
1010 REM ************************
1020 IF b=INT b AND b>0 AND b<65536 THEN GO TO 6000
1106 REM ************************
1107 REM *Amend mantissa to be  *
1108 REM *   >= .5 and <1       *
1109 REM ************************
1110 IF b<.5 THEN LET b=b*2: LET power=power-1: GO TO 1110
1120 IF b>=1 THEN LET b=b/2: LET power=power+1: GO TO 1110
1130 GO SUB 5200
1995 REM ************************
1996 REM * Calculate exponent & *
1997 REM *  binary string (e$)  *
1998 REM ************************
2000 LET etemp=power+128: FOR n=7 TO 0 STEP -1: IF 2^n>etemp THEN GO TO 2020
2010 LET e$(8-n)="1": LET etemp=etemp-2^n
2020 NEXT n: GO SUB 5000
2995 REM ************************
2996 REM *Form binary string a$*
2997 REM *  from mantissa b     *
2998 REM ************************
3000 LET num=b: LET pow2=-1: FOR n=1 TO 32: LET x=2^pow2
3010 IF x>num THEN GO TO 3030
3020 LET a$(n)="1": LET num=num-x
3030 LET pow2=pow2-1: NEXT n: GO SUB 5010: GO SUB 4000: GO TO 1000
3995 REM ************************
3996 REM *Check 33rd. bit and   *
3997 REM *round up mantissa if  *
3998 REM *   33rd. bit is 1.    *
3999 REM ************************
4000 IF 2^pow2>num THEN GO TO 4040
4010 FOR n=32 TO 1 STEP -1: IF a$(n)="0" THEN LET a$(n)="1": LET n=1: GO TO 4030
4020 LET a$(n)="0"
4030 NEXT n
4040 GO SUB 5020: PRINT : RETURN
4995 REM ************************
4996 REM *   Print routines     *
4997 REM ************************
5000 PRINT : PRINT "Exponent byte:";
5005 PRINT PAPER 6;e$: PAPER 7;" (";power;"+128";" AND b<>0;")": PRINT : RETURN
5010 PRINT "Binary mantissa before rounding:": GO TO 5100
5015 REM ************************
5016 REM *  Consider sign bit   *
5017 REM ************************
5020 PRINT "Binary mantissa after rounding:": GO SUB 5100: IF s=-1 THEN LET a$(1)="1"
5030 IF s=1 THEN LET a$(1)="0"
5040 PRINT "Binary mantissa including sign:"
5100 FOR n=1 TO 25 STEP 8: PRINT PAPER n/8; INK 7;a$(n TO n+7);: NEXT n
5110 FOR n=1 TO 25 STEP 8: LET dec=0: FOR m=0 TO 7: LET dec=dec+(2^(7-m)*VAL a$(n+m)): NEXT m: PRINT TAB n;"(";dec;")";: NEXT n: PRINT : PRINT : RETURN
5200 PRINT "Equation ";a;"=";b;"*2^";power''"Solution= ";b*2^power: RETURN
5900 REM ************************
5901 REM *Small integer routine*
5902 REM ************************
6000 PRINT "Number: ";a: PRINT "Number is a 'small integer'": PRINT
6004 REM ************************
6005 REM * Set 2nd byte to 255  *
6006 REM *& add 65536 to number*
6008 REM *if number is negative*
6009 REM ************************
6010 IF s=-1 THEN FOR n=1 TO 8: LET a$(n)="1": NEXT n: LET b=-b+65536
6015 REM ************************
6016 REM *Convert no. to binary*
6017 REM *less significant byte*
6018 REM *        first.       *
6019 REM ************************
6020 LET b1=b-256*INT (b/256): LET b2=INT (b/256): FOR n=7 TO 0 STEP -1: IF 2^n>b1 THEN GO TO 6040
6030 LET a$(9+(7-n))="1": LET b1=b1-2^n
6040 NEXT n
6050 FOR n=7 TO 0 STEP -1: IF 2^n>b2 THEN GO TO 6070
6060 LET a$(17+(7-n))="1": LET b2=b2-2^n
6070 NEXT n: LET b=0
6100 PRINT "1st. byte: ";: PAPER 6;"00000000": PAPER 7;" (0)": PRINT : PRINT "Remaining 4 bytes:": GO SUB 5100
6110 GO TO 1000
```

Monitor program data completed

This week sees the rest of the listing of Monitor for the C64. Hopefully you should have last week's issue at hand and can start entering the listing from the beginning. If all the data is correct then the program should be saved. If not, an error message will appear indicating the whereabouts of the error in the data. The machine code is called by a *Sys 41952*

```
1370 DATA 193,173, 44,192,141, 42,192,173, 45,192,141, 43,192, 32
1380 DATA 146,194, 96, 32, 45,196, 32, 90,196,162, 15,160,  0,169
1390 DATA  48,153,  3,192,200,192, 15,208,248,189,  4,193,201,  0
1400 DATA 240,  4,153,  3,192,136,202,224,255,208,240, 32, 34,194
1410 DATA 173, 44,192,141, 42,192,173, 45,192,141, 43,192, 32,146
1420 DATA 194, 96,169,192,141, 41,202,169, 46,141, 40,202, 32, 32
1430 DATA 202, 32,181,196,173, 42,192,141, 38,192,173, 43,192,141
1440 DATA  37,192, 96,169, 36, 32,210,255,160,  0,185, 23,192, 32
1450 DATA 210,255,200,192,  4,208,245,169, 32, 32,210,255, 32,210
1460 DATA 255, 96, 32, 52,197,169, 13, 32,210,255,173, 37,192,133
1470 DATA  69,133, 71,173, 38,192,133, 70,133, 72, 96,141, 42,192
1480 DATA  32, 86,194,173, 23,192, 32,210,255,173, 24,192, 32,210
1490 DATA 255, 96,201, 32,144,  8,201,160,176,  6,201,128,144,  2
1500 DATA 169, 46, 32,210,255, 96,160,  0,174,254,192, 24, 32,240
1510 DATA 255, 32, 81,197,160,  0,152, 72,177, 71, 32,131,197,169
1520 DATA  32, 32,210,255,104,168,200,192,  8,208,237,169, 32, 32
1530 DATA 210,255,160,  0,152, 72,177, 71, 32,150,197,104,168,200
1540 DATA 192,  8,208,242, 96, 32,126,198,173,254,192,240, 20,165
1550 DATA  69, 56,233,  8,133, 69,176,  2,198, 70,206,254,192, 32
1560 DATA 172,198, 76, 78,199,165, 71, 56,233,  8,133, 71,176,  2
1570 DATA 198, 72,165, 69, 56,233,  8,133, 69,176,  7,198, 70,169
1580 DATA   0,141,254,192, 32,  1,200, 76, 78,199, 32,126,198,173
1590 DATA 254,192,201, 23,240, 20,238,254,192,165, 69, 24,105,  8
1600 DATA 133, 69,144,  2,230, 70, 32,172,198, 76, 78,199,169, 23
1610 DATA 141,254,192,165, 71, 24,105,  8,133, 71,144,  2,230, 72
1620 DATA  32,  1,200, 76, 78,199, 32,126,198,173,255,192,201,  7
1630 DATA 240,  9,230, 69,208,  2,230, 70,238,255,192, 76, 52,198
1640 DATA  32,126,198,173,255,192,240,198,206,255,192,198, 69,165
1650 DATA  69,201,255,208,187,198, 70, 76, 52,198, 32,220,198,160
1660 DATA   0,185,  0,193,153,251,  0,200,192,  4,208,245,160,  0
1670 DATA 177,251,201,128,144,  9, 41,127,145,251,200,192,  2,208
1680 DATA 241,160,  0,177,253,201,128,144,  4, 41,127,145,253, 96
1690 DATA  32,220,198,160,  0,185,  0,193,153,251,  0,200,192,  4
1700 DATA 208,245,160,  0,177,251,201,128,176, 10, 24,105,128,145
1710 DATA 251,200,192,  2,208,240,160,  0,177,253,201,128,176,  5
1720 DATA  24,105,128,145,253, 96,169,  4,141,  1,193,141,  3,193
1730 DATA 169,  7,141,  0,193,169, 32,141,  2,193,173,254,192,141
1740 DATA  42,192,173, 42,192,240, 34,169, 40, 24,109,  0,193,141
1750 DATA   0,193,144,  3,238,  1,193,169, 40, 24,109,  2,193,141
1760 DATA   2,193,144,  3,238,  3,193,206, 42,192, 76,244,198,173
1770 DATA 255,192, 24,109,  2,193,141,  2,193,144,  3,238,  3,193
1780 DATA 173,255,192,109,255,192,109,255,192, 24,109,  0,193,141
1790 DATA   0,193,144,  3,238,  1,193, 96, 32,108,197,169,  0,141
1800 DATA 254,192,141,255,192, 32,  1,200,169, 64,141,138,  2,169
1810 DATA   0,133,198, 32,159,255, 32,228,255,201,  0,240,237,201
1820 DATA  17,240, 41,201, 29,240, 40,201,145,240, 39,201,157,240
1830 DATA  38,201, 80,208,  6, 32,226,203, 76, 78,199,201, 81,208
1840 DATA   4, 32,126,198, 96,201, 48,144,199,201, 71,176,195, 76
1850 DATA  67,200, 76, 28,198, 76, 80,198, 76,223,197, 76,102,198
1860 DATA 169,  0,133,198, 32,159,255, 32,228,255,201,  0,240,242
1870 DATA 201, 66,208,  4, 32,253,196, 96,201, 68,208,  4, 32,123
1880 DATA 196, 96,201, 72,208,222, 32,181,196, 96,169, 13, 32,210
1890 DATA 255,162,  0,189, 32,192, 32,210,255,232,224,  5,208,245
1900 DATA 169, 13, 32,210,255,162,  0,169, 36, 32,210,255,189, 23
1910 DATA 192, 32,210,255,232,224,  4,208,245,169, 13, 32,210,255
1920 DATA 169, 37, 32,210,255,162,  0,189,  3,192, 32,210,255,232
1930 DATA 224, 16,208,245, 96,165, 71, 72,165, 72, 72,173,254,192
1940 DATA  72,169,  0,141,254,192,165, 71,141, 43,192,165, 72,141
1950 DATA  42,192, 32, 86,194, 32,168,197,238,254,192,165, 71, 24
1960 DATA 105,  8,133, 71,144,  2,230, 72,173,254,192,201, 24,208
1970 DATA 219,104,141,254,192, 32,172,198,104,133, 72,104,133, 71
1980 DATA  96,141, 44,192, 32,220,198,160,  0,173,  0,193,141, 97
1990 DATA 200,173,  1,193,141, 98,200,185, 44,192,201, 65,176,  8
2000 DATA 105,128,153,  0,  4, 76,107,200,105, 63, 76, 96,200,192
2010 DATA   1,240, 16, 32,251,200,201, 48,144,249,201, 71,176,245
2020 DATA 160,  1, 76, 87,200,160,  0,185, 44,192, 56,233, 48,153
```

```
2030 DATA  44,192,201, 10,144,  2,233,  7,153, 44,192,200,192,  2
2040 DATA 208,233,173, 44,192, 10, 10, 10, 10, 24,109, 45,192,141
2050 DATA  44,192,165, 72,153, 70,173,254,192, 10, 10, 10, 24,109
2060 DATA 255,192,101, 71,133, 69,144,  2,230, 70,160,  0,173, 44
2070 DATA 192,145, 69, 72,173,  2,193,141,246,200,173,  3,193,141
2080 DATA 247,200,104,201,128,144,  3, 56,233,128,201, 32,176,  5
2090 DATA 169, 46, 76,242,200,201, 64,144, 13,201, 96,176,  6, 56
2100 DATA 233, 64, 76,242,200, 56,233, 32, 24,105,128,141,  0,  4
2110 DATA  76, 78,199,138, 72,152, 72,169, 64,141,138,  2,169,  0
2120 DATA 133,198, 32,159,255, 32,228,255,240,248,141, 45,192,104
2130 DATA 168,104,170,173, 45,192, 96,169,192,141, 41,202,169, 78
2140 DATA 141, 40,202, 32, 32,202,169, 13, 32,210,255, 32, 45,196
2150 DATA 160,  0,152, 72, 32,251,200,104,168,173, 45,192,201, 20
2160 DATA 208, 11, 32,210,255,192,  0,240,235,136, 76, 50,201,201
2170 DATA  32,208,  6, 32,210,255, 76, 50,201,201, 13,240, 27,201
2180 DATA  48,144,213,201, 71,176,209,201, 64,240,205,153,  4,193
2190 DATA  32,210,255,200,192, 21,208,194,136, 76, 50,201, 32,210
2200 DATA 255,140,250,192,169,192,141, 41,202,169,118,141, 40,202
2210 DATA  32, 32,202,169, 13, 32,210,255,160,  0,162,  0,189,  4
2220 DATA 193, 56,233, 48,201, 10,144,  3, 56,233,  7, 10, 10, 10
2230 DATA  10,141, 42,192,232,189,  4,193, 56,233, 48,201, 10,144
2240 DATA   3, 56,233,  7, 41, 15, 24,109, 42,192,153,  4,193,232
2250 DATA 236,250,192,240,  4,200, 76,144,201,173,250,192, 74,141
2260 DATA 250,192,169,  0,170,141,217,201,141,218,201,189,  4,193
2270 DATA 221, 17, 17,208, 39,232,236,250,192,208,242,173,217,201
2280 DATA 141, 43,192,173,218,201,141, 42,192, 32, 86,194,160,  0
2290 DATA 185, 23,192, 32,210,255,200,192,  4,208,245,169, 32, 32
2300 DATA 210,255,238,217,201,173,217,201,201,  0,208,  3,238,218
2310 DATA 201,162,  0,173,218,201,201,  0,208,187,173,217,201,208
2320 DATA 182, 96,169, 13, 32,210,255,160,  0,185, 46,192,201, 64
2330 DATA 240,  7, 32,210,255,200, 76, 39,202, 96,169,192,141, 41
2340 DATA 202,169,136,141, 40,202, 32, 32,202,169, 13, 32,210,255
2350 DATA  32,154,199,169, 13, 32,210,255, 32,210,255, 32,192,199
2360 DATA  96, 32, 82,197,169, 13, 32,210,255,173, 37,192,141,250
2370 DATA 192,173, 38,192,141,251,192,169,192,141, 41,202,169, 63
2380 DATA 141, 40,202, 32, 62,197,173, 37,192,141,252,192,173, 38
2390 DATA 192,141,253,192, 96,169,192,141, 41,202,169,158,141, 40
2400 DATA 202, 32, 32,202,169, 13, 32,210,255, 32, 45,196, 32, 90
2410 DATA 196,140, 41,192,169,192,141, 41,202,169,168,141, 40,202
2420 DATA  32, 32,202,169, 13, 32,210,255, 32,251,200,201, 48,144
2430 DATA 249,201, 64,176,245, 56,233, 48,141,209,202, 96, 32, 87
2440 DATA 202, 32,133,202, 32,208,202, 76,226,202,169,  1,170,168
2450 DATA  32,186,255,173, 41,192,160,193,162,  4, 32,189,255, 96
2460 DATA 173,250,192,133,251,173,251,192,133,252,169,251,172,253
2470 DATA 192,174,252,192, 32,216,255, 96, 32,133,202, 32,208,202
2480 DATA 169,  0, 32,213,255, 96, 32, 87,202,169,192,141, 41,202
2490 DATA 169,208,141, 40,202, 32, 32,202,169, 13, 32,210,255, 32
2500 DATA 181,196,173,250,192,141, 53,203,173,251,192,141, 54,203
2510 DATA 173, 42,192,141, 57,203,173, 43,192,141, 56,203,173,  0
2520 DATA 128,141,  0,144,173, 54,203,205,253,192,208, 14,173, 53
2530 DATA 203,205,252,192,208,  6,169, 13, 32,210,255, 96,238, 53
2540 DATA 203,208,  3,238, 54,203,238, 56,203,208,215,238, 57,203
2550 DATA  76, 82,203, 32, 87,202,169,192,141, 41,202,169,229,141
2560 DATA  40,202, 32, 32,202,169, 13, 32,210,255,160,  0, 32,251
2570 DATA 200,201, 48,144,249,201, 71,176,245,201, 64,240,241, 32
2580 DATA 210,255,153, 23,192,200,192,  2,208,230,169, 13, 32,210
2590 DATA 255, 32,190,193,173,250,192,141,172,203,173,251,192,141
2600 DATA 173,203,173, 42,192,141,  0,128,174,173,203,236,253,192
2610 DATA 208,  9,174,172,203,236,252,192,208,  1, 96,238,172,203
2620 DATA 208,231,238,173,203, 76,171,203, 32, 52,197,169, 13, 32
2630 DATA 210,255,173, 37,192,141,223,203,173, 38,192,141,224,203
2640 DATA  32,240,255, 96,169,  4,170,160,  0, 32,186,255,169,  0
2650 DATA 141, 44,192,141, 45,192, 32,189,255, 32,192,255,162,  4
2660 DATA  32,201,255, 32,132,204, 32,204,255,169,  4, 32,195,255
2670 DATA  96, 32,247,193,160,  0,185, 24,193,201, 36,240, 20,201
2680 DATA  64,208,  9,169, 13, 32,210,255,200, 76, 14,204, 32,210
2690 DATA 255,200, 76, 14,204, 32,251,200,201,140,208,  6, 32,202
2700 DATA 203, 76, 12,204,201, 67,208,  6, 32, 54,202, 76, 12,204
2710 DATA 201, 69,208,  6, 32, 64,199, 76, 12,204,201, 76,208,  6
2720 DATA  32,248,202, 76, 12,204,201, 83,208,  6, 32,196,202, 76
2730 DATA  12,204,201, 66,208,  6, 32,  4,203, 76, 12,204,201, 84
2740 DATA 208,  6, 32, 27,201, 76, 12,204,201, 70,208,  6, 32, 99
2750 DATA 203, 76, 12,204,201, 81,240,  3, 76, 12,204, 96,165, 71
2760 DATA  72,165, 72, 72,173,254,192, 72,169,  0,141,254,192,165
2770 DATA  71,141, 43,192,165, 72,141, 42,192, 32, 86,194, 32,168
2780 DATA 197,169, 13, 32,210,255,238,254,192,165, 71, 24,105,  8
2790 DATA 133, 71,144,  2,230, 72,173,254,192,201, 24,208,214,104
2800 DATA 141,254,192, 32,172,198,104,133, 72,104,133, 71, 96

READY.
```

A maze for every Amstrad

by J. Kennedy



This is a version of the classic 3D type maze game in which the object as always is to find the exit. This program uses the logical colours of the CPC to draw each view almost immediately. There is also a tune that is driven by the *Every* command. A map can be displayed by pressing the fire/copy button.

To make things even easier the location of the exit can be shown by deleting the *Rem* statement in line 2190. Indeed, it should be reasonably easy to add extra features to the program and tailor it to your desires.

Note that the arrows in the instructions are obtained by using *Print Chr$(240)* (for example) to print to the screen and then copying them into the program line by using the cursor keys.

The final part of the listing will appear next week.

```
10 ' +-----------------------------------
-----+
20 ' !   Three Dimensional Maze Program
     !
30 ' !        (C) 1986  J.Kennedy
     !
40 ' +-----------------------------------
-----+
50 ENV 1,15,-1,1:ENV 2,5,-1,4
60 pit=0.5
70 envs=1:sm=1:count=1:bass=1:DIM n(128)
:FOR a=1 TO 128:READ n(a):n(a)=n(a)/2:NE
XT a
80 DIM MAZE%(25,80)
90 GOSUB 2570
100 MODE 0:BORDER 0:PEN 1:INK 1,26,13:PA
PER 0:INK 0,0
110 LOCATE 5,10
120 PRINT "PLEASE WAIT"
130 PEN 1
140 GOSUB 1190
150 INK 1,26
160 GOSUB 210
170 GOSUB 1260
180 GOSUB 1750
190 GOSUB 1870
200 GOTO 180
210 REM DRAW GENERAL MAZE
220 CLS
230 REM indicators
240 FOR a=1 TO 20
250 PLOT 290-a,390,14
260 DRAWR 0,-20
270 PLOT 350+a,390,15
280 DRAWR 0,-20
290 NEXT a
300 INK 15,26:INK 14,26
310 PLOT 270,390,1
320 DRAWR 20,0:DRAWR 0,-20:DRAWR -20,0:D
RAWR 0,20
330 PLOT 350,390,1
340 DRAWR 20,0:DRAWR 0,-20:DRAWR -20,0:D
RAWR 0,20
350 GOSUB 1870
360 TAG
370 MOVE 264,360
380 PRINT CHR$(255);
390 MOVE 344,360
400 PRINT CHR$(254);
410 TAGOFF
420 REM outline
430 PLOT 0,0,1
440 DRAWR 639,0
450 DRAWR 0,399
460 DRAWR -639,0
470 DRAWR 0,-399
480 REM outer square
490 FOR a=190 TO 451 STEP 4
500 PLOT a,280,3
510 DRAWR 0,-160
520 NEXT a
530 REM inner square
540 FOR a=290 TO 350
550 PLOT a,220,2
560 DRAWR 0,-40
570 NEXT a
580 REM outer left lines
590 PLOT 0,0,4
600 DRAW 190,120
610 PLOT 0,399
620 DRAW 190,280
630 DRAW 190,120
640 REM inner left lines
650 PLOT 190,120,5
660 DRAW 290,180
670 PLOT 290,220
680 DRAW 190,280
690 REM outer right lines
700 PLOT 639,0,6
710 DRAW 446,120
720 PLOT 639,399
730 DRAW 446,280
740 DRAW 446,120
750 REM inner right lines
760 PLOT 446,120,7
770 DRAW 346,180
780 PLOT 446,278
790 DRAW 346,220
800 REM outer exit left
810 FOR a=184 TO 4 STEP -4
820 PLOT a,120,8
830 DRAWR 0,160
840 NEXT a
850 REM inner exit left
860 FOR a=194 TO 288
870 PLOT a,180,9
880 DRAWR 0,40
890 NEXT a
900 REM outer exit right
910 FOR a=450 TO 635 STEP 4
920 PLOT a,120,10
930 DRAWR 0,160
940 NEXT a
950 REM inner exit right
960 FOR a=346 TO 444 STEP 4
970 PLOT a,180,11
980 DRAWR 0,40
990 NEXT a
1000 GOSUB 2430
1010 RETURN
1020 REM CREATE MAZE
1030 FOR a%=1 TO 24:FOR b%=1 TO 80:maze%
(a%,b%)=1:NEXT:NEXT
1040 q=40:w=10:maze%(w,q)=0
1050 tc=0
1060 odw=0:odq=0
1070 dq=-1+INT(RND*3):dw=-1+INT(RND*3)
1080 IF ABS(dq)=ABS(dw) THEN GOTO 1070
1090 IF odq=-dq AND odw=-dw THEN GOTO 10
70
1100 odq=dq:odw=dw
1110 q=q+dq:w=w+dw
1120 IF q>76 OR q<4 THEN q=q-dq
1130 IF w>22 OR w<2 THEN w=w-dw
1140 maze%(w,q)=0
1150 tc=tc+1:ct=ct+1:IF ct=4 THEN ct=0:G
OTO 1070
1160 IF tc<500 THEN GOTO 1110
1170 bx=w:by=q
```

```
1180 RETURN
1190 REM INITIALIZE
1200 GOSUB 1920
1210 GOSUB 1020
1220 x=10:y=40
1230 dir=1
1240 t=TIME
1250 RETURN
1260 REM DRAW VIEW
1270 GOSUB 1920
1280 PLOT 1000,1000,1
1290 TAG:MOVE 304,368
1300 IF dir=2 THEN c=241
1310 IF dir=3 THEN c=243
1320 IF dir=4 THEN c=240
1330 IF dir=1 THEN c=242
1340 PRINT CHR$(c);:TAGOFF
1350 IF x=bx AND y=by THEN INK 13,26
1360 IF maze%(x,y)=1 THEN RETURN
1370 ON dir GOTO 1380,1470,1660,1570
1380 REM look north
1390 IF y=bx AND y-1 = by THEN INK 12,26
1400 IF maze%(x-1,y)=1 THEN INK 4,20 ELSE IF maze%(x-1,y-1)=1 THEN INK 8,20
1410 IF maze%(x+1,y)=1 THEN INK 6,20 ELSE IF maze%(x+1,y-1)=1 THEN INK 10,20
1420 IF maze%(x,y-1)=1 THEN INK 3,20:INK 2,20:INK 5,20:INK 7,20:INK 9,20:INK 11,20:INK 12,20:RETURN
1430 IF maze%(x-1,y-1)=1 THEN INK 5,10 ELSE IF maze%(x-1,y-2)=1 THEN INK 9,10
1440 IF maze%(x+1,y-1)=1 THEN INK 7,10 ELSE IF maze%(x-1,y-2)=1 THEN INK 11,10
1450 IF maze%(x,y-2)=1 THEN INK 2,10:RETURN
1460 RETURN
1470 REM look east
1480 IF x+1 = bx AND y=by THEN INK 12,26
1490 IF maze%(x,y-1)=1 THEN INK 4,20 ELSE IF maze%(x+1,y-1)=1 THEN INK 8,20
1500 IF maze%(x,y+1)=1 THEN INK 6,20 ELSE IF maze%(x+1,y+1)=1 THEN INK 10,20
1510 IF maze%(x+1,y)=1 THEN INK 3,20:INK 2,20:INK 5,20:INK 7,20:INK 9,20:INK 11,20:INK 12,20:RETURN
1520 IF maze%(x+1,y-1)=1 THEN INK 5,10 ELSE IF maze%(x+2,y-1)=1 THEN INK 9,10
1530 IF maze%(x+1,y+1)=1 THEN INK 7,10 ELSE IF maze%(x+2,y+1)=1 THEN INK 11,10
1540 IF maze%(x+2,y)=1 THEN INK 2,10
1550 RETURN
1560 REM hello Cathy
1570 REM look west
1580 IF x-1 = bx AND y=by THEN INK 12,26
1590 IF maze%(x,y+1)=1 THEN INK 4,20 ELSE IF maze%(x-1,y+1)=1 THEN INK 8,20
1600 IF maze%(x,y-1)=1 THEN INK 6,20 ELSE IF maze%(x-1,y-1)=1 THEN INK 10,20
```


If you go down to the woods today...
you're sure of a swift demise...
—Zzap! 64
"Don't delay, buy it today."
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C+VG HIT!
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PALACE

Updown print

by A. M. Scott

This routine provides sideways text on any Amstrad CPC machine. Text can be printed either upwards from the current cursor position (set with *Locate*) or downwards and so can be used to label graphs and charts.

Once the program has been successfully entered and saved it can be used as follows: *a$= "text" Up,@a$* or *Down @a$* depending on which direction you want the text to go in.

The routine redefines Chr$(255) so *Symbol 255* should not be used in your own program which incorporates *Updown Print*.

```
10 MODE 2:cs=0:MEMORY &A3FF
20 FOR addr=&A400 TO &A493
30 READ byte$
40 POKE addr,VAL("&"+byte$):cs=cs+PEEK(addr)
50 NEXT
60 IF cs<>17883 THEN PRINT CHR$(7)"ERROR in DATA statements!":END
70 CALL &A400:PRINT"|UP,@a$ and |DOWN,@a$ commands initialised.":END
80 DATA 2A,A1,A4,CB,6E,C0,CB,EE,01,11,A4,21
90 DATA 94,A4,C3,D1,BC,19,A4,C3,20,A4,C3,27
100 DATA A4,55,D0,44,4F,57,CE,00,FE,01,00,3E
110 DATA 0B,18,05,FE,01,C0,3E,0A,32,A0,A4,DD
120 DATA 6E,00,DD,66,01,46,23,5E,23,56,EB,7E
130 DATA E5,C5,CD,A5,B8,CD,06,B9,E8,0E,08,3A
140 DATA A0,A4,F5,FE,0B,CC,72,A4,C4,83,A4,CD
150 DATA 09,B9,3E,FF,21,98,A4,CD,A8,BB,3E,FF
160 DATA CD,5A,BB,F1,CD,5A,B8,3E,08,CD,5A,BB
170 DATA C1,E1,23,10,CA,C9,21,A0,A4,1A,06,08
180 DATA 2B,17,CB,16,10,FA,13,0D,C8,18,EF,21
190 DATA 98,A4,1A,06,08,17,CB,1E,23,10,FA,13
200 DATA 0D,C8,18,EF
```

Italics

by Jonathan Temple

Italic characters can easily be produced thanks to this short machine code routine which can be incorporated in your own programs as a *Basic* subroutine called once or can be loaded at &A00 as a machine code program.

Once the program has been run it can be used by entering *"Line text*.

The routine will only work in graphics modes and characters 254 and 255 must not be redefined as they are used by the program.

```
10 FOR pass=0 TO 1
20 P%=&A00:[OPT pass*2
30 BEQ bad:LDA &355:CMP #3
40 BEQ bad:CMP #6:BCS bad
50 STX &F2:STY &F3:LDY #0
60 .loop LDA (&F2),Y:STA &CF7
70 CMP #13:BEQ out
80 TYA:PHA:LDX #&F7:LDY #&C
90 LDA #10:JSR &FFF1:PLA:TAY
100 LSR &CFE:LSR &CF9:LSR &CFA
110 ASL &CFD:ASL &CFE:ASL &CFF
120 LDA #255:JSR &FFEE:INY
130 BPL loop:.out JMP &FFE7
140 .bad JMP &E310:]:NEXT
150 ?&200=0:?&201=&A
```

Restorer

by Paul Lambert

The following routine enables the user to access the last *Newed* program. This is possible because the Commodore 64 does not clear the memory but alters certain pointers to the start of Basic text.

To try out the program type it in, save it, run it and then type *New*. If you now list the program nothing is displayed. Now try *Sys 49152* and *List* to see the program restored.

The machine code is completely relocatable.

```
10 A=0
20 READ B:POKE49152+A,B
30 A=A+1:IF B=0 THEN END
40 GOTO20
50 DATA 169,8,160,1,145,43,32,51,165,165,34,133
60 DATA 45,133,47,133,49,165,35,133,46,133,48,
   133,50,96,0

READY.
```

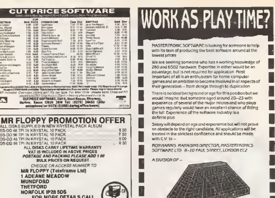
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The 'V' Signal

J Ogilvy, of Batham in London, writes

Q I have been programming the 6502 microprocessor for some time now but have still to work out what the 'V' flag does. I have never had to use it as my lack of knowledge has never been a problem. However, I have finally decided that I might as well find out, and your *Peek and Poke* section seemed the obvious place to ask

A The Overflow or V flag in the 6502 can be used in two ways. The first is when performing signed binary arithmetic operations where bit 7 the most significant bit is used as the sign. If an arithmetic operation produces a result that cannot be stored as a signed 7 bit number, the overflow flag is set otherwise it is cleared

The second use is with the *Bit* instruction which is used to compare the bits of a memory location with the accumulator by *Anding* them non-destructively together. The N flag is set to the value of the memory bit 7, the V flag to memory bit 6, and the Z flag is set if the result of the *And* is zero

The following instructions affect the overflow flag. For signed binary arithmetic ADC SBC. For other operations BIT CLV, PLP, RTI

Manual for moon

Mike Chand of Basingstoke, Hants writes

Q I recently bought an Amstrad 664, after seeing it play *Moon Cresta* in a local shop. After many frustrating hours, I managed to connect it up, but on switching it on, it just says on the screen

Amstrad 64K Microcomputer
© 1984 Amstrad Consumer Electronics Plc and Locomotive Software Ltd
Basic 1 1
Ready

I have tried typing in *Moon Cresta, moon cresta, MOON CRESTA* but the machine refuses to play. The shop where I bought the computer has recently gone bust so could you please help me

A Well have tried reading the manual? (of course not nobody every does) Failing this it may be a good idea to buy the software put it in the disk drive, and follow the loading instructions

Noise about Noise

Simon Walker of Redditch, Worcs, writes

Q According to your answer to H Smart of Selkirk (Vol 5 No 23), there is only one way of stopping the Spectrum making a noise while loading. In fact, there is a less destructive method. Simply connect the Ear lead from the tape recorder to the MIC input of the computer. Programs can be then be loaded as normal and the sound is no more. Sometimes errors occur if the tape is poor quality or if it is a bad tape to tape copy

A OK I didn't know that so thanks for the help Colin Bishop John Halstead Uncle Tom Cobbley et al. Still if you have trouble loading a tape with the above method, you could always try connecting the ear to the ear and suffer the noise (or use the biscuit tin method)

Debugging on the Amstrad CPC664

G A Smith of Ashton, in Lancs writes

Q I have an Amstrad CPC 664 (pretty rare beast by all accounts) and have been trying to understand what the DDT program does

A DDT (Dynamic Debugging Tool) is a useful little program that allows you to rummage around inside CP/M to see what is going on. It sits high up in the memory so as not to interfere with other programs that might be in the system at the same time. It is executed by typing in *DDT* at the *A>* prompt. Alternatively, it can load another program (one to be examined) at the same time with *A> DDT Test Com*. To use the program properly, you will need a CP/M manual but if you want to fiddle around until you can afford the documentation, the following is a list of the commands

A assemble – followed by the start address in hex. This allows you to type in machine code mnemonics directly, eg

```
-A100
100MVI C,2
102MVI E 65
104CALL 5
107 RET
108
```

Just hit carriage return to end the code

D dump – followed by an address in hex allows memory to be dumped in hex format 16 lines at a time. An end address can also be specified eg,

```
-D100 11E
```

F fill – followed by a start address, an end address and what to fill with fills the memory section specified, eg,

```
-F200,2FF A5
```

fills the memory from 200 to 2FF with A5s

G Goto – transfers program control to the address specified. *Go* performs a cold start and takes you back to CP/M. You can also set breakpoints by putting them after the start address eg

```
-G100 1FF 230
```

sets breakpoints at 1FF and 230 with the code starting at 100

H hex arithmetic – will give the sum and difference of the arguments in hex

```
-H880 8C08
```

gives then sum C580 and the difference 4D80

L list – is the inverse of the A command and disassembles a section of memory starting at the given address eg

```
-L100
```

disassembles 12 lines of instructions

M move – a block of memory from one position to another, eg.

```
-M100 120,200
```

takes the block between 100 and 120 and moves it to 200 to 220

R read – reads a program into memory. The file name must first be set up with *I* so

```
-ITEST COM
```

and then

```
-R
```

reads *Test Com* into memory at its starting address

S set memory – allows single numbers to be inserted into memory eg

```
-S2FE
```

produces

```
2FE11
```

typing a new number will replace 11. Pressing return moves on to the next address, pressing full stop followed by return ends the input

T trace – tells the computer to trace the program as it executes. The number of instructions executed is specified in the argument

U untrace – does the same as trace but no output is sent to the screen. The specified number of instructions are executed allowing parts of the program to be skipped in the tracing process

X examine regs – allows any of the 8080s registers to be examine and changed. The register to be looked at is specified as the argument. It can be any of *A B D H S P M C Z E I* where *MCZEI* are flags. *BDHS* are double registers (*BC DE* etc) and *A* is the accumulator

And that is all there is to it

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Keen Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2R 3LD



The main modems explained

David Wallin with the first of a two-part article on modems and frequencies

This week I ll be giving a brief description of how the main types of modem work and the frequencies involved

Slow speed modems, those that work at up to 1200 baud (in fact up to 2400) basically work by converting electrical voltages into sounds and back again Medium and high speed modems work by converting electrical voltages into radio frequency tones Also there are RTTY (Radio Teletype) modems which don't operate via cables, but transmit and receive radio signals

Slow speed modems

What I call a slow speed modem is a modem which is suitable for operation on the PSTN (Public Switched Telephone Network – British Telecom phone lines). These modems should work at 1200 baud or less To tell the truth, 2400 baud can be used on the PSTN, but is both risky and expensive to do so The reason that the speeds should be low is that even though the BT lines are fairly high quality they are not nearly high enough quality for accurate high speed data transfer These modems work by converting voltages in your computer into an audio tone at a certain frequency The tones used, by both CCITT and Bell are given in the table below

At the heart of a slow speed modem is usually one chip an AM7910 This chip is capable of transmitting and receiving at speeds of 1200, 600, 300 and 75 bps, conforming to either CCITT or Bell standards and at any of the three modes of duplex (full, half or simplex) It also contains most of the requirements for a CCITT V24 auto-answer This chip can be bought for under £25 and this price drops to around £15 when it is bought in bulk

These modems work by transmitting the binary Ascii value of the character For example *A* has an Ascii value of 65 which is 1000001 in binary To transmit this at CCITT V21 ORIG a tone of 980 Hertz would be sent followed by a tone of 1180 Hertz, another four 1180 Hz would follow and finally another 980 Hz So the list of frequencies used is 980, 1180, 1180 1180 1180 1180 980 This is a simplified version as carriers parity start and stop bits have to be sent as well

The answer tone is the tone put out by the answering modem for a few seconds to say that connection has been made This tone can be used by auto baud selection modems to decide what speed they should be set for

Higher speed modems

At speeds about 1200 baud there are two options for connection of computers back-to-back using very high quality cable, and radio frequency transmission via coaxial cable Connecting two computers back-to-back allows very high speed data transmission rates and there are two ways of doing it

Over short distances a wire from the Rx on one computer is connected to the Tx on the second and the Tx on the first speeds can be used RS 232 ports can often be set for speeds such as 4800 9600 and even 19200 baud

Over long distances, leased lines are used These are high quality wires that are rented from BT and computers can be connected to them As they are of high quality and are still covering relatively short distances high speeds can be used

Coaxial cable can be used to transmit a radio frequency tone rather than an audio tone This has the another advantage in that by using lots of different frequencies, more than one computer-conversation can take place over the line at one time

The higher the speed, the more error checking is required Parity is a form of error checking as are Xmodem, modem4 and modem7 On high speed modems, CRC (cyclic Redundancy Check) error checking is used as it is far more advanced than crude Xmodem etc

For further reading on this subject I can recommend *The New Improved Hackers Hand Book* by Hugo Cornwall (Century Communications, £6 95) and *Hotline* by Ben Knox (also published by Century £6 95 in paperback) Both books go into modem frequencies in some detail

Next week the explanation of modems will continue with the description of intelligent modems

Prometheus, the viewdata board for astronomers now has a *Popular Computing Weekly* section It is there for you to leave me (only me, not the rest of the magazine) a message This can be a lot faster than mailing it to the magazine It also has a news and what s coming on the communications page feature

Questions and queries should have an answer on the board within a week, unless I have to do a lot of research in which case it will be longer The answers are visible to all as are the questions so why not log on and see if there s anything interesting there The most interesting messages questions and answers will appear in the magazine

The *Popular*/David Wallin section is reached from option 8 on the main menu or by keying *08# at any time

The number of the board is 01-300 7177, viewdata format. Many thanks to Barry Spencer, the sysop of Prometheus

CCITT/Bell name	Speed (bps)	Duplex	Frequencies (Hz) Transmit 00	Transmit 01	Receive 00	Receive 01	Answer
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*any speed up to 300 bps ie, 110 bps used the same frequencies as 300 bps
CCITT V23 mode 2 has two sub modes, these depends on the *back* speed 1200 bps or 75 bps this effects the duplex, half or full This can be seen on the chart.

Music shows, microvoxes and drum kits

Mark Jenkins with news from the world of micro music . . .

Now we've finished our Micro Music Glossary (thanks to Chris Jordan of Hybrid Technology for the basics), it should be possible to use all sorts of obscure terms without anyone writing in for clarification Unless of course you know different

Coincidentally there's some exciting news from Hybrid Technology The company which launched the Music 500 for the BBC B has now announced the most important event since then – the launch of its successor, the Acorn 5000 It's a software and hardware package which will be available in the form of a software and documentation upgrade for existing 500 owners and will increase the compositional abilities of the system quite considerably

Further details of the new 5000 package are thin on the ground at the moment since it's being officially launched at the 4th Official Acorn User Exhibition at the Barbican Centre Golden Lane London EC2 from Thursday 24th to Sunday 27th July After that time we'll fill in more details on the system or you could contact Hybrid at Unit 3 Robert Davies Court Nuffield Road, Cambridge CB4 1TP

If you're interested in synthesiser-based music as opposed to that coming strictly from computer sound chips ESSP have just the tape for you It's the official Winner's Compilation of the 9th International Synthesiser Tape Contest sponsored by Roland TDK Fotex, TASCAM and other companies

With 14 tracks featuring winners aged 14 to 37 the music is highly varied There's a classical piece performed by a Japanese High School's synthesiser orchestra, various experimental pieces and a good selection of more commercial material Price is £4 95 inc p&p from Synsound, The Sound House PO Box 37b East Molesey Surrey KT8 9JB

Good news for Amstrad owners as Cheetah Marketing announces the launch of the 464/664/6128 version of the SpecDrum imaginatively named the AmDrum

AmDrum is a digital to analog converter playing sounds sampled from real drums and arranging them in complex patterns and songs The interface costs £34 95 and comes with a kit of eight drum sounds, kick (bass drum) snare mid tom, low tom cowbell open and closed hi-hat and claps New voices can be loaded from cassette and a Latin Kit (£3 99) and Electro Kit (£4 99) are already available – an edit facility provided with new kits makes it possible to mix and match sounds from each kit to produce unique combinations

The AmDrum interface has an audio output socket for any home hi-fi and several demo songs are provided with the software to get you playing as quickly as possible Rhythms can be written one beat at a time or in real time sixteen songs up to 64 patterns long can be stored in memory and saved to cassette The unit synchronises to tape machines and availability is through larger Boots and Menzies and computer stores

> "At £34 95 the AmDrum represents a spectacular bargain"

As mentioned in last week's review of the SpecDrum update the sounds from Cheetah's system are almost of professional quality and the new Electro kit is particularly powerful At £34 95 the AmDrum represents a spectacular bargain

Returning to the BBC Micro there's a new accessory for the UMI-2B system marketed by The London Rock Shop The Midi ConVertor takes Midi output signals from the UMI and makes them available in the form of trigger gate and velocity level to control older analog synthesisers The ConVertor has been created with the MiniMoog in mind, since it's still popular in many professional studios but has no way to synchronise to Midi or computers However, the ConVertor will equally well connect the UMI system to the Roland SH-101, Korg MS10 or MS20 Roland SH09 or any one of a number of monophonic analog synths now available very cheaply on the new and secondhand market

The ConVertor should also be suitable for use with other dedicated and computer-based sequencers but the unit we looked at went crazy when a Midi clock signal was mixed in with the note information This means that the Roland MSQ700 sequencer can't be used as a source, since it gives off Midi clocks even when stopped but computer-based packages such as Sound Technology's C-Lab on the C64 seem to be OK.

It's possible that U-Music the manufacturer of the UMI-2B and ConVertor will have a few new products soon since it will shortly become completely independent of The London Rock Shop Until that time more information is available from the shop at 26 Chalk Farm Road London NW1 01-267 7851

Lastly, a mention of the Microvox sampler, an incredible monophonic sampling system for the C64 which supports Midi inputs and provides waveform editing disc storage and echo-harmoniser functions The manufacturer Supersoft, have released some new samples arranged into five sections orchestral and strings wind and brass instruments guitars and basses drums and percussion keyboards and miscellaneous Each section fills both sides of one brightly-coloured disc and there are 123 samples in all including electronic and synthesised sounds as well as the real thing

The complete library costs £29 95 and is available through two music outlets – Gigsounds in Catford SE London and JSG Music in Barnsley, Yorkshire as well as by mail from Supersoft Winchester House Canning Road Wealdstone Harrow Middx HA3 7SJ Credit orders can be placed on 01-861 1186 during office hours

Just another mention that the British Music Fair at London Olympia from August 1st-3rd includes a computer music stand featuring the C64 Apple Atari MSX Spectrum and other micros Your author will be showing off C-Lab for the C64 and various other packages shows run all day every day and detailed timetables will be available at the Fair Special tube and train services run to Kensington Olympia station and admission to the show is £3

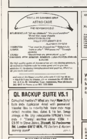
If you have any queries or tips for this column, please write to Mark Jenkins at *Popular Computing Weekly*, 12-13 Little Newport Street London WC2H 7PP Mark would also welcome examples of your own music on audio or program tape, or disc

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New Releases

John Cook looks through this week's new arrivals

Amstrad

Program *Speech* **Type** *Utility* **Micro** Amstrad CPC **Price** £9 95 (tape) £14 95 (disc) **Supplier** Superior Software Regent House Skinner Lane Leeds LS7 1AX

Program *Gladiator* **Type** Arcade **Micro** Amstrad CPC **Price** £8 95 **Supplier** Domark, 204 Worpole Rd London SW20 8PN

Program *Bonzo Clone Arranger* **Type** Utility **Micro** Amstrad CPC **Price** £9 00 **Supplier** Nemesis. 10 Carlow Rd Ringstead Kettering, Northants NN14 4DW

Program *Star Firebirds* **Type** Arcade **Micro** Amstrad **Price** £1 99 **Supplier** Firebird 74 New Oxford St, London W1

Program *Hellchopper* **Type** Arcade **Micro** Amstrad **Price** £1 99 **Supplier** Firebird, 74 New Oxford St London W1

Program *The Boggit* **Type** Adventure **Micro** Amstrad CPC **Price** £7 95 **Supplier** CRL 9 Kings Yard Carpenters Rd. London E15

Program *The Image System* **Type** Utility **Micro** Amstrad CPC **Price** £19 95 (tape) £24 95 (disc) **Supplier** CRL 9 Kings Yard Carpenters Rd, London E15

Do you watch Top of the Pops? Come on now admit it you do sometimes don't you? So with that off your chest, have you ever wanted to create those wacky video effects on your Amstrad? The ones where the picture twists around and turns inside out but somehow still doesn't make Peter Powell look a day under 40 If your artistic aspirations lie in that particular direction *The Image System* is certainly a package worth looking at

Apart from being a competently put together art package, it specialises in being able to modify a particular image once you have created it Rotation magnification colour filtering twisting – there is enough here to keep the average budding video producer happy for quite some time

Note that it can't let you animate such pictures in realtime – but you can create some stunning static effects Such pictures can be incorporated into your own programs or dumped to a printer using utilities included in the program The only major reservation would be that actual drawing appears only to be under cursor control – no facilities for patching in a mouse or joystick But still – you'll be amazed at what you can do with this one

Atari

Program *Screaming Wings* **Type** Arcade **Micro** Atari XL/XE **Price** £7 95 (tape) £9 95 (disc) **Supplier** Red Rat Software. PO Box 12 Prescot Merseyside, L35 5HG

Program *Technicolor Dream* **Type** Utility **Micro** Atari XL/XE **Price** £9 95 (tape) £12 95 (disc) **Supplier** Red Rat Software, PO Box 12, Prescot, Merseyside

Pick of the week

Warhawk – impressive

Program *Warhawk* **Type** Arcade **Micro** CBM 64 **Price** £1 95 **Supplier** Firebird, 74 New Oxford St, London WC1

The perfect arcade game has to be fast loud smart, original graphically superb – all these things – plus that something extra that draws you back to the machine time and time again Admittedly any three from that list of six is enough to make a game acceptable – enter *Warhawk*

Warhawk can certainly get fast and if you turn the volume up, it gets pretty damn loud too (great music by Hubbard incidentally), Smart? Definitely Original? Well I'm prepared to accept collective unconscious as an excuse for recurrent themes in Peruvian and Scandinavian folklore However when it comes to harsh metallic graphics in a space shoot-em up, combined with emplacements you destroy for extra points this has everything Programmed by Proteus Developments *Warhawk* has much of the style, panache and sophistication of *Uridium* which is still front runner in the 'Game of 86 stakes

The difference is that in *Warhawk* there is a constant vertical scroll in which you can move up and down the screen as you move along the surface of the battlecruiser (or whatever it is) blasting bits avoiding mines, zapping away

The graphics are excellent, but this is where we come to the elusive X factor Does *Warhawk* require just one more go?

The answer is that it doesn't have that immediate effect but it didn't stop the game from impressing, and £1 99 makes it a great little budget title

Set the autofire to 'on' (there'll be an unexpected surprise on Level Four incidentally) and go for it, but don't expect any intense intellectual stimulation Out sometime in August

Program *Panic Express* **Type** Arcade **Micro** Atari XL/XE **Price** £3 95 (tape) £5 95 (disc) Supplier Red Rat Software PO Box 12 Prescot Merseyside

Program *Second City* **Type** Arcade **Micro** CBM 64 **Price** £5 95 (tape) £9 95 (disc) **Supplier** Novagen 142 Alcester Rd Birmingham, B13 8HS

Mercenary was very well received when it was finally released – and quite rightly so It had an unique combination of adventure and arcade action set in a believable 3-D environment Now if you're bored with your present version of Therg, here's another challenge for you *The Second City* This is a data set that you load in to the original game (note it is not a stand alone product) which gives you another version of the game to play

Novagen are giving little away at the moment, but say that the substantial differences occur below ground – although having said that the most obvious difference of all is that while Tharg Mk 1 was predominantly green, Mk II is red

Although this can't be judged on a brief assessment, it looks as though if you are already a *Mercenary* fan then this is going to extend the playing life of your game quite a bit

BBC/Electron

Program *Mikie* **Type** Arcade **Micro** BBC/Electron **Price** £8 95 **Supplier** Imagine, 6 Cen-

tral St Manchester M2 5NS

Commodore 64

Program Speech **Type** Utility **Micro** Commodore 64 **Price** £9.95 (tape) £14.95 (disc) **Supplier** Superior Software, Regent House Skinner Lane Leeds LS7 1AX.

Program *The Second City* **Type** Arcade **Micro** Commodore 64 **Price** £5.95 (tape) £9.95 (disc) **Supplier** Novagen 142 Alcester Rd Birmingham B13 8HS

Program *Spill Personalities* **Type** Arcade **Micro** Commodore 64 **Price** £8.95 **Supplier** Domark 204 Worpole Road, London SW20 8PN

Program *Freak Factory* **Type** Arcade **Micro** Commodore 64 **Price** £1.99 **Supplier** Firebird, 74 New Oxford St London W1

Freak Factory? Sounds like something a bit too close to home for comfort Still at least here at Sunshine Towers we don't have to crawl around the floor to avoid getting killed or jump over electrified poles – except at the Christmas party, of course

In this arcade adventure, it is your task, as agent number 1 of the galactic police force (one of the more far flung branches of the regional crime squad) to enter the lair of an evil genius, who is attempting universal domination You attempt this with no more than your physical agility and fighting skills I'm pleased any, this all adds up to a most enjoyable romp

The game has two phases firstly you roam through the corridors of the complex (looking a bit like the a denim clad Sir Arthur Pendragon) avoiding traps and the like Then (if you haven't died) you enter the lab which is done in very much smaller scale Here you must beat up four assistants (by frantically waggling the joystick) and avoiding more nasties Do this in all five labs escape and you will have saved the Universe Great fun Good luck.

Program *The Boggit* **Type** Adventure **Micro** Commodore 64 **Price** £7.95 **Supplier** CRL, 9 Kings Yard Carpenters Rd London E15

Program *Panic Express* **Type** Arcade **Micro** Commodore 64 **Price** £3.95 (tape) £5.95 (disc) **Supplier** Red Rat Software PO Box 12 Prescot, Merseyside L35 5HQ

C16/Plus 4

Program *The Second City* **Type** Arcade **Micro** Plus 4 **Price** £5.95 (tape) £9.95 (disc) **Supplier** Novagen, 142 Alcester Rd Birmingham, B13 8HS

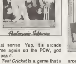
PCW 8256/8512

Program *Blackstar* **Type** Adventure **Micro** Amstrad PCW **Price** £14.95 **Supplier** CRL, 9 Kings Yard, Carpenters Rd London E15

Program *SAS Raid* **Type** Adventure **Micro** Amstrad PCW **Price** £14.95 **Supplier** CRL 9 Kings Yard, Carpenters Rd London E15

Program *Graham Gooch's Test Cricket* **Type** Arcade **Micro** Amstrad PCW **Price** £10.95 **Supplier** Audiogenic Softwarer, PO Box 88 Reading Berkeshire

I haven't seen the English cricket team look so green – well – since the end of the



last sense Yup, it's arcade time again on the PCW, god bless it.

Test Cricket is a game that's been about a bit for quite some time on the Commodore, with a recent Amstrad CPC conversion, and I'm pleased to say that it comes across well on the PCW

Select your teams (with full editing options supported) and away you go with England playing at home to Australia The arcade sequences are just as fast as any other version the major problem being the lack of sound Still with the program supporting both the DK Tronics and Cascade PCW joysticks, this is a game that arcade addicts and sports simulation freaks alike will be smuggling into the office to put up at lunchtime

Spectrum

Program *The Boggit (Bored Too)* **Micro** Spectrum **Price** £7.95 **Supplier** CRL, 9 Kings Yard Carpenters Rd London E15

Program *Star Firebirds* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Firebird 74 New Oxford St. London W1

Firebird has been busy this week with amongst others *Star Firebirds* being released on both Spectrum and Amstrad formats The actual programmers are calling themselves Insight Software – heaven knows why as it doesn't need very much insight to convert a five year old arcade game onto two Z80 machines surely?

Space Firebirds as it was called then, was a post Galaxian creation in which swarms of alien birds swoop around your spaceship bombs drop out of the sky and all hell generally breaks loose *Star Firebirds* is very much like this except it is totally lacking in excitement.

I can't recall the original version being particularly fast, but it feels like both conversion are significantly slower – very much so as far as the Spectrum is concerned Sound effects are minimal and although the Amstrad version rates a little higher than its brother neither can be recommended If you're after a cheapie than won't stretch you, it's a maybe at best.

Program *Ace* **Type** Arcade **Micro** Spectrum **Price** £9.99 **Supplier** Cascade Games Ltd 1-3 Haywra Crescent, Harrogate, North Yorkshire HG1 5SG



Charts

Top Twenty

1	(3)	Ghosts and Goblins	Elite
2	(1)	Leaderboard	US Gold
3	(5)	Kung Fu Master	US Gold
4	(4)	Green Beret	Imagine
5	(2)	Jack The Nipper	Gremlin Graphics
6	(6)	Ninja Master	Firebird
7	(8)	Molecule Man	Mastertronic
8	(8)	Kik Start	Mastertronic
9	(10)	Formula One Simulator	Mastertronic
10	(12)	Speed King	Mastertronic
11	(–)	ACE	Cascade
12	(11)	Knight Tyme	Mastertronic
13	(–)	Thrust	Firebird
14	(15)	Way Of The Tiger	Gremlin Graphics
15	(–)	Booty	Firebird
16	(7)	Knight Games	English
17	(–)	Hulk	Americana
18	(–)	They Sold a Million (2)	Hit Squad
19	(17)	Bomb Jack	Elite
20	(–)	Street Olympics	Mastertronic

Ghost and Goblins hits the top

ACE – new entry this week

Top Tens

All figures compiled by Gallup/Microscope

Amstrad

1	(–)	Ghosts and Goblins	(Elite)
2	(1)	Elite	(Firebird)
3	(2)	Kane	(Mastertronic)
4	(4)	Molecule Man	(Mastertronic)
5	(–)	Knight Tyme	(Mastertronic)
6	(3)	Green Beret	(Firebird)
7	(6)	Harvey Headbanger	(Firebird)
8	(5)	Storm	(Mastertronic)
9	(10)	Redzone	(Mastertronic)
10	(9)	Kung Fu Master	(US Gold)

Mastertronic – always a chart force to be reckoned with

Commodore 64

1	(1)	Leaderboard	(US Gold)
2	(4)	Ghosts and Goblins	(Elite)
3	(3)	Speed King	(Mastertronic)
4	(2)	Green Beret	(Imagine)
5	(3)	Knight Games	(English)
6	(7)	Ninja Master	(Firebird)
7	(–)	Silent Service	(US Gold)
8	(5)	Thrust	(Firebird)
9	(–)	Video Poker	(Mastertronic)
10	(8)	Bump set Spike	(Mastertronic)

Atari

1	(2)	Beer Belly	(Americana)
2	(1)	Kik Start	(Mastertronic)
3	(8)	Hulk	(Americana)
4	(–)	Castle Assault	(Bluebird)
5	(5)	Last V8	(Mastertronic)
6	(4)	Nuclear Nick	(Americana)
7	(–)	Shamus	(Americana)
8	(–)	Darts	(CDS)
9	(10)	New York City	(Americana)
10	(7)	Cloak of Death	(Bugbyte)

BBC

1	(–)	Thrust	(Superior)
2	(2)	Air Wolf	(Elite)
3	(–)	Tennis	(Bugbyte)
4	(6)	Commando	(Elite)
5	(3)	Cricket	(Bugbyte)
6	(–)	Great Wall	(Artic)
7	(5)	Star Force 7	(Bugbyte)
8	(–)	Comp Hits 10 (2)	(Beau Jolly)
9	(–)	Cosmic Battle	(US Gold)
10	(–)	Death Star	(Superior)

Spectrum

1	(1)	Jack the Nipper	(Gremlin)
2	(2)	Kung Fu Master	(US Gold)
3	(3)	Ghosts and Goblins	(Elite)
4	(5)	Ninja Master	(Firebird)
5	(4)	Molecule Man	(Mastertronic)
6	(–)	ACE	(Cascade)
7	(–)	F1 Simulator	(Mastertronic)
8	(7)	Knight Tyme	(Mastertronic)
9	(–)	Master of Magic	(Mastertronic)
10	(6)	Green Beret	(Imagine)

NEXT WEEK

● **PCW disc interface**

The range of add-ons for the 8256 continues to grow apace. Gemini Marketing's multi-standard disc interface gets the Popular test.

● **Setting up in business**

At last . . . we can unveil David Ridge's article on running a small software company.

● **Games**

More graphics packages – this time for Amstrad owners CRL's *Image System* enables you to create masterpieces with all the zoom, and variable brush features which are becoming standard. See how *Image System* shapes up next week

● **Atari ST owners**

Number processing made easy – with our listing

The Hackers

Good morning gentlemen.

So, our computerised id-card card system went live at last night's cup-final...

& I take it we've all seen the morning papers...

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